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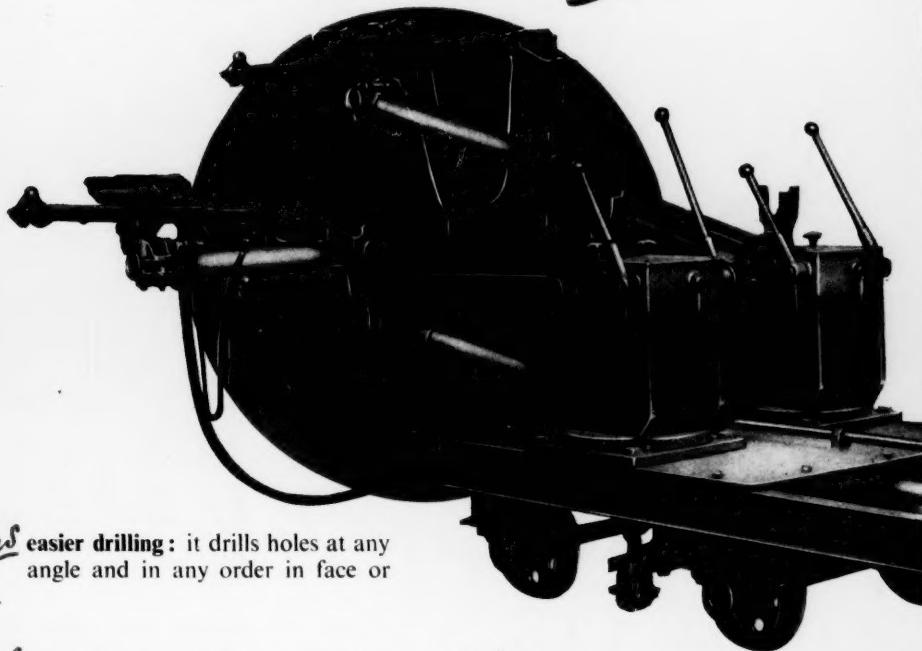
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LONDON, JANUARY 11, 1952

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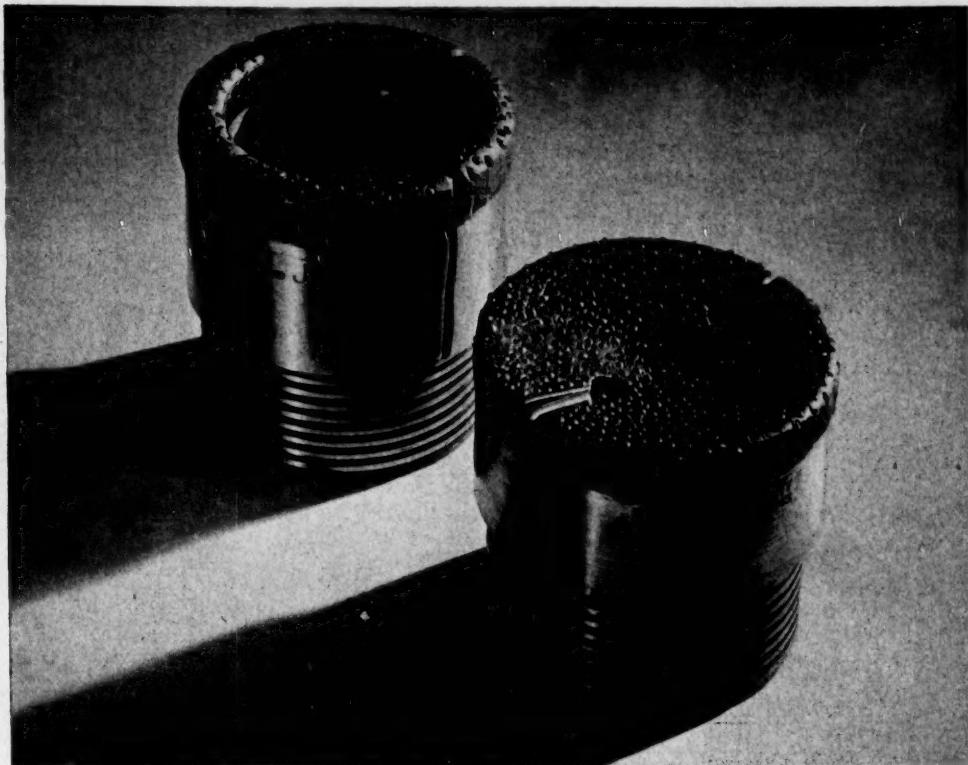
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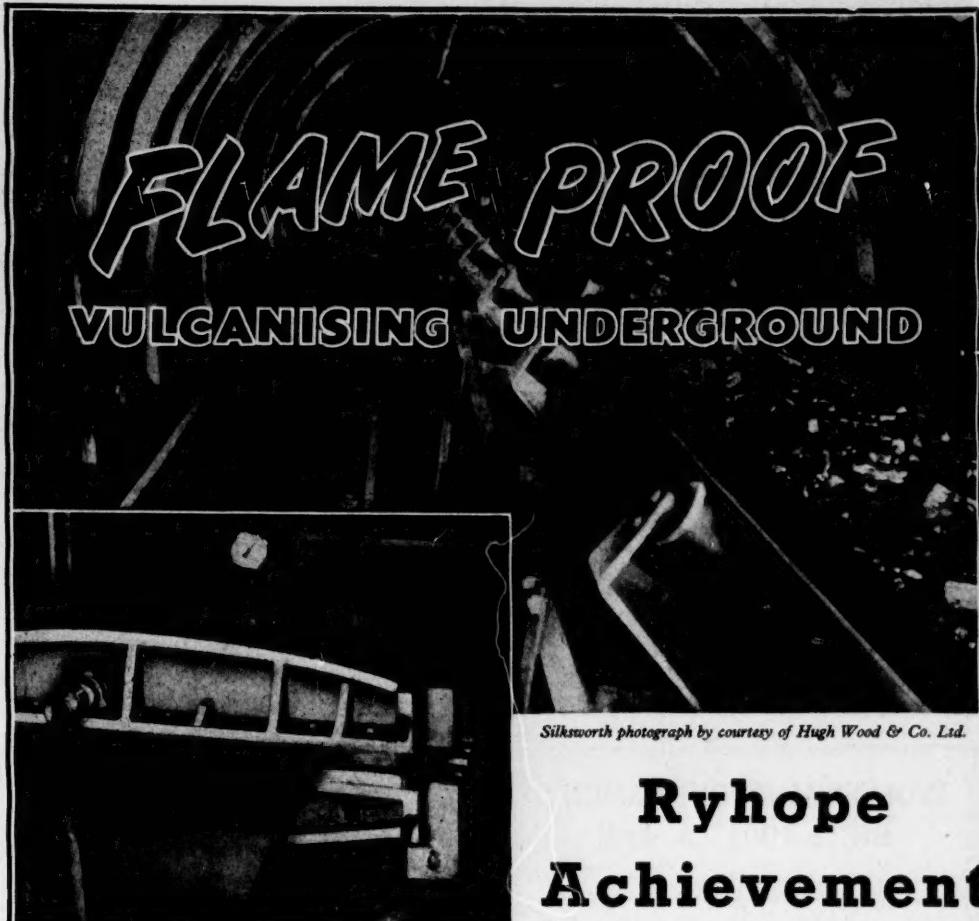
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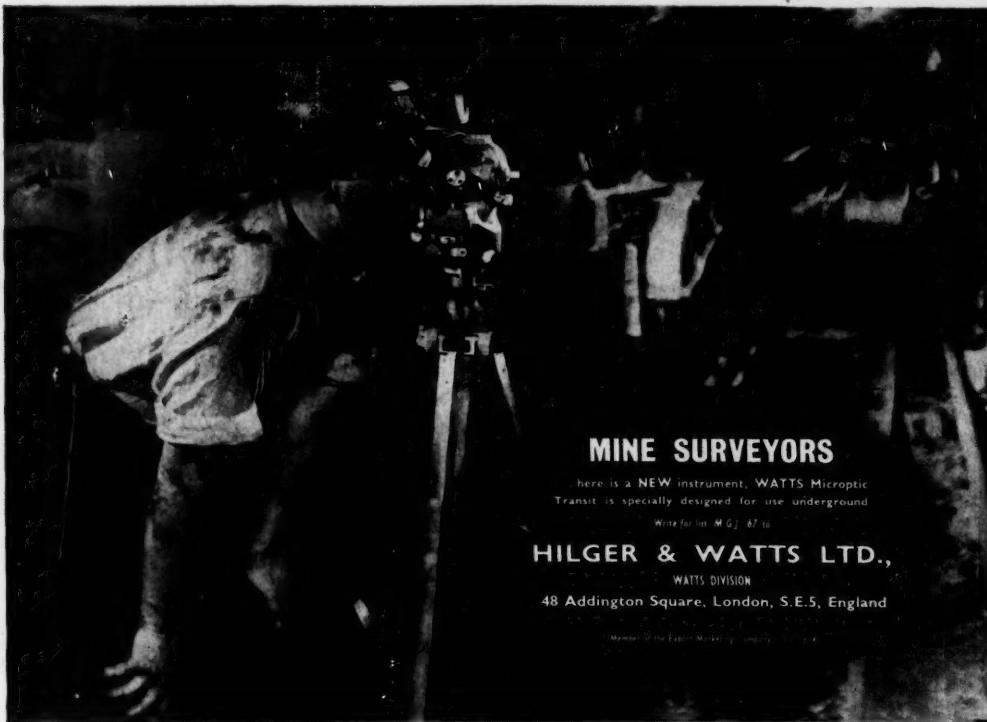
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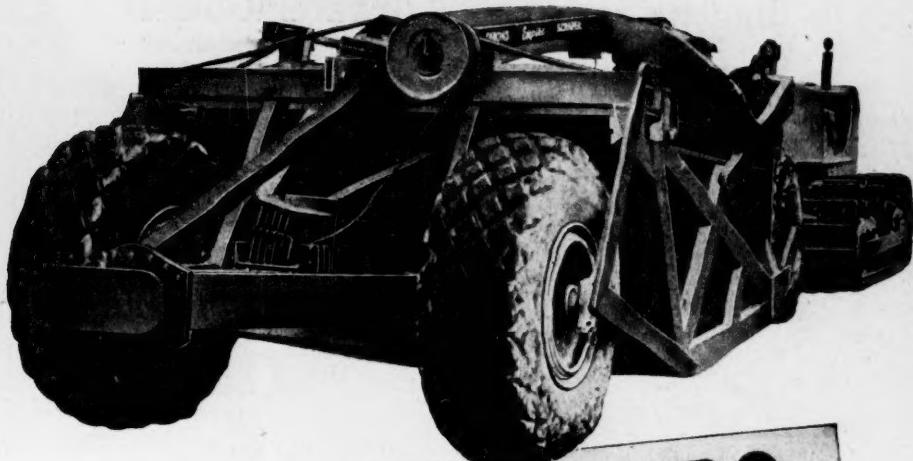
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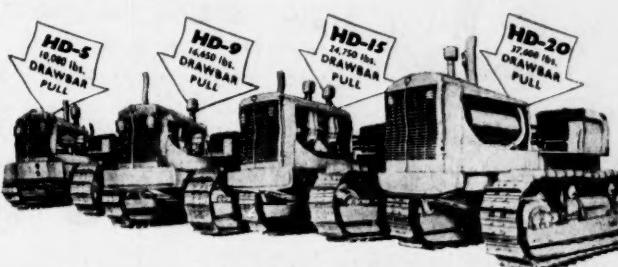
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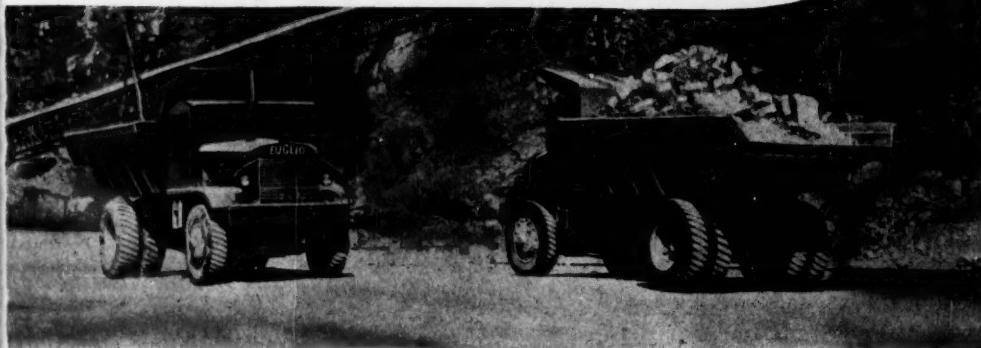
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The Mining Journal

Established 1855

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NOTES AND COMMENTS

Recent Developments in British Guiana

Mining activity in British Guiana enjoyed its most active period in the first decade of the century, since when with fluctuating fortunes it has made little progress with the exception of the working of the bauxite deposits by the Demerara Bauxite and the Berbice companies. In the main, interest has centred on the alluvial gold industry but with the decline of the activity of "pork-knockers," output has been on a very small scale. The chief reason for this decline has been the failure to locate any deposits of sufficient magnitude to justify the investment of capital on a large scale. The principal producer to-day is the British Guiana Consolidated Goldfields operating two dredges, one on the upper Mahdia and a second on the lower Potaro Rivers, which for the book year ended July 31, 1950 totalled 6,105 f.oz.

The great depth in many cases to which the decomposed rock extends has been a serious handicap in proving any vein deposits in depth. However, with the increased attention which has been paid since the war to serious scientific prospecting coupled with the increased staffing of the Government Geological Survey, such work has been intensified. Unfortunately the results as detailed in the report of the Government Geological Survey Department for 1950 proved disappointing. The Anaconda British Guiana Mines, a subsidiary of the Great Anaconda Copper Mining Company, in the last three years spent a large amount of money in the Omai, Potaro, and Aremu areas, contained in an exclusive prospecting permit covering some 5,400 sq. miles. At the Omai Mines the company carried out some 40,000 ft. of diamond drilling besides extensive surface work, put in 3,158 ft. of adits, and sank a three compartment shaft 399 ft. deep, besides 4,214 ft. of underground drifts, cross-cuts and raises. This attempt to disclose the character of the formation in unaltered rock unfortunately failed to indicate the possibility of economic operation as the average gold content of the mineralized zones was generally very low and in consequence the company decided to suspend operations in August, 1950. This decision also decided the fate of the Potaro and Aremu operations which closed down about the same time. Meanwhile underground working by the Cuyuni Goldfields Company ceased about the middle of 1948 as after six years of operation and the winning of

56,636 f.oz. of gold a total loss of some \$150,000 had been sustained. Production from surface working continued and in 1950 produced approximately 4,200 oz. In 1951 the Barima Gold Company had a single bucket gold dredge under construction due to come into operation at the end of last year.

Nor is the Survey report on diamonds encouraging. In 1950 the Kurupung Dredging Co. ceased their exploration of the alluvial diamond areas in the river of that name, and the Diamond and Metals Corporation abandoned their prospecting of the Epping River, and their dredge was capsized in the course of transfer to the Upper Mazaruni. The Kurupung Placers Company has since continued to prospect the Kurupung River flats and there was considerable activity on the Kuribrong River during 1950.

A representative of the U.S. Steel Corporation made a short study of some manganese deposits at Tasawinni on the Barama River but the results do not appear to have justified any further action.

The further investigation of a deposit of magnetite near the mouth of the Putareng River was carried out by Mr. J. Hamilton of the Survey but the area of the deposit appears small. Another Government geologist, Mr. G. Henderson made a brief survey of a deposit reported to carry the uraniferous mineral euxenite but the Geiger-Muller counts proved unfavourable. Euxenite is said to be worked as a uranium ore only in Madagascar but its presence as an indicator of other pegmatite mineral is judged worthy of consideration.

Projected Uganda Railway to Extend to Kilembe Copper Mines

Uganda has been advised to proceed with a project for a £4,000,000 railway extension to bring important mineral deposits, forests, and potential farmland within reach of development. A Government Economic Survey Committee has reported favourably on the plan after considering the practicability of extending the railway system 200 miles westward from Kampala, near the North shore of Lake Victoria, into the neighbourhood of copper deposits at Kilembe. The new railway would end at Lake George, and open out a large area of Western Uganda which is at present both sparsely populated and underdeveloped.

Of special importance is the fact that the new railway would carry copper ore from the Kilembe mines, to be

exploited by a group including Frobishers, and Rio Tinto, which plan to produce up to 5,000 tons of ore daily. The survey committee urged that ore should be railed to Jinja, near Kampala, for refining, and it considered that the new hydro-electric schemes on the Nile would enable an electric smelting plant to deal economically with copper concentrates. Moreover, the new route would bring into production large areas where the rainfall and climate generally are favourable for agriculture. This would provide new land for settling the rising African population.

Northern Rhodesia and the Kariba Gorge Scheme

An outline of the Northern Rhodesia Government's approach to the Kariba Gorge and Kafue Gorge hydro-electric schemes was given by the Governor of Northern Rhodesia, Sir Gilbert Rennie, in a recent address delivered in Bulawayo. He revealed that the Government was taking steps to engage a firm of consultants to investigate the possibilities of a scheme at the Kafue Gorge. This did not necessarily mean that it would not participate in the Kariba Gorge scheme in co-operation with the Government of Southern Rhodesia. It meant that it would like to have the potentialities of the Kafue Gorge investigated, as those of the Kariba Gorge had been, before any conclusion about either scheme was made. Both schemes would ultimately be needed to supply the rapidly expanding power requirements of the two Rhodesias.

"If, on investigation, it appears to be possible to bring an interim scheme into operation on the Kafue River some time before the first stage of the Kariba scheme could be concluded, such a scheme would materially assist both Rhodesias at a time when demands for more power would have to be met by thermal generation, involving the transport of large quantities of coal or Diesel oil, and the heavy consumption of water. Such an interim scheme would be designed to be complementary to, and capable of being integrated with, the main Kariba scheme, and also any major scheme on the Kafue River. We hope to be able to get in the first stage 200 megawatts of power from the Kafue scheme at a much smaller capital expenditure, proportionately, than is involved in the first stage of the Kariba scheme." (The report of the Inter-Territorial Hydro-Electric Power Commission established by the Central African Council, on the Kariba Gorge project, was referred to in *The Mining Journal*, July 13, 1951.)

Utilization of Indian Mineral Resources

The policy of the Government of India regarding the utilization of her mineral resources had been outlined recently by Dr. Krishnan, the Director of the Geological Survey of India. According to a report from our Indian Correspondent, he emphasized that, as far as possible, it was intended to utilize mine output within the country, instead of exporting it as hitherto. The personnel of the Geological Survey of India had been increased recently, but facilities for investigation had not been expanded as speedily because the necessary equipment had not been forthcoming.

The most serious investigation now in progress was for sulphur deposits in view of the great sulphur shortage obtaining in India. It was intended to investigate, and utilize, all possible sources and an investigating party had been sent to Bihar. Dr. Krishnan also added that India might develop lead and zinc mining in Rajasthan, where it was taken up for the first time during World War II, as well as copper deposits. As far as Madras was concerned, the survey was taking up a sulphur proposition in the North Arcot district, and certain old copper workings in Kurnool, and he expressed the view that, from the point of view of mineral wealth, Bihar would rank first, Rajasthan second, and Madras third.

Australia

(From Our Own Correspondent)

Melbourne, December 31

The prospect of an immediate and substantial increase in Australian copper production rests with the Mount Isa Mines, in North Queensland. The bringing into production of the copper lode, by the completion of the copper concentration and smelting sections of the plant will double the output of copper in this country, but production will still be considerably below local demand. It is expected that the new section of operations will be producing by the middle of 1952, with an estimated rate of output of 18,000 tons of blister copper per year.

A recent decision, however, of the Industrial Court with regard to the payment of the lead bonus to employees may seriously affect the new project. A lead bonus, similar to that introduced at Broken Hill, based solely on the selling price for lead, and in no way an incentive to effort and production, was granted some two years ago to employees, by the Queensland Industrial Court, despite strong protests by the Mount Isa Company. Under this impost, the Company pays out approximately £A.170,000 per month as bonus, equivalent to 40s. per ton of ore mined, a payment which was shown in evidence, goes practically entirely to hotel keepers and bookmakers. Late in 1951 the Company applied to the Industrial Court for a variation of the bonus conditions, requesting that the starting point be changed from £57 per ton of lead to £95 per ton. In deferred judgment on the application, the Court declined to make the desired change, mainly on the ground that the Company had been able to pay a dividend of 25 per cent after substantial provision for taxation. An innovation has, however, been introduced providing that the amount of the bonus being paid at the time of the hearing, namely £A.17 5s. per week, shall be the maximum bonus payable.

The position affecting the working of the copper section is that an equivalent of the lead bonus must be paid to workers in this section. The resulting situation has been expressed by the chairman of directors thus: "The Company will have to consider the wisdom of completing the copper plant now under construction and the operation of it, even if completed, if this exorbitant bonus has to be paid to employees producing copper as well as those producing lead."

(Since the date of our correspondent's letter, it has been announced that Mount Isa Mines has handed dismissal notices to 100 men and that further construction work on the copper production plant now hung in the balance. With regard to the working of the copper section, it was also announced by Mr. K. B. Gross, the acting general manager of Mount Isa Mines, that the copper price would not support the artificial level of wages, that lead and zinc production had so far sustained. Mr. Gross also said that no change in current production policy was under consideration.—*Ed. M.J.*)

INVESTORS AND FREE MARKET SALES

So far as renewal of interest in gold mining is concerned, following the opening of the free market to Australian producers, the attitude of the investing public is unchanged. Meanwhile, the Gold Producers' Association has been formed with headquarters in Western Australia, but has been registered in Victoria. The unknown factors in the matter are how much gold can be absorbed by the free market without the increasing supply depressing the price offering on the open market and, how long it will take the present rising costs, based on uncontrolled wage increases to overtake the increased margin of profit.

Labour Problems in the Australian Coal Mining Industry

Coal mining continues to be the most important factor in Australian industrial life, with its direct bearing upon steel production, transport, and the many secondary industries that have grown since the end of 1945. According to a despatch from our Australian Correspondent, the whole chaotic position is the direct result of organized policy on the part of the unions concerned, directed against the steel industry. It is recognized that the question has become critically important, not only to the country, but to the miners themselves.

In spite of the great advances in underground mechanization by a number of companies, underground production over the last 10 years has remained almost unchanged, while the minimum coal requirements of the country have increased by about 6 per cent yearly—an increase that has been barely satisfied by the extension of open cut mining, a branch that has escaped the control of the Miners' Federation.

NEED FOR PEACE IN COAL MINING INDUSTRY

Regardless of the increased production from this source, it is estimated that New South Wales production for the coming year will be 3,000,000 tons below the State's estimated needs. That this deficiency could be nearly met by peace in industry is clear from the figures for 1951, which show that to November 10 the loss in output as a result of strikes, was 1,690,000 tons, or 417,000 tons more than the loss in the previous year, and it is probable that the loss for the full year will be approximately 2,000,000 tons, or nearly enough to make unnecessary the importation of coal.

Under existing industrial conditions and considering the low return on investment, investors will not provide capital for new coal mining enterprises, particularly while improved operating methods are consistently offset by a deliberate restriction of output.

With the object of improving the position of the coal mining industry, the Joint Coal Board was formed. The dual objects of this Board have been, and are, the mechanization of collieries, and the improvement of the working and social conditions of the coal miners.

The Board has already spent £A.6,000,000 on the purchase of coal mining machinery, the sale of which to private companies has been strongly opposed by the Federal Parliamentary Labour Opposition, despite the obvious fact that such equipment will be more efficiently used if owned by the operating colliery, than if merely hired.

On the other side the Board has spent £A.967,748 between July 1, 1948, and June 30, 1951, on amenities in the coalfields, but no increase in underground coal output has resulted, nor any improvement in industrial relations.

SIGNIFICANT STATEMENT BY LARGE COLLIERY GROUP

Despite greatly improved conditions, a statement by a large colliery group is significant. Fourteen per cent of possible working days were lost through strikes during the year and an even greater loss was due to absenteeism. Experience shows that increased mechanization increases the number of man-shifts worked: this is, however, offset by the increased number of petty strikes.

With the object of stimulating production, the Coal Industry Tribunal awarded an Attendance Bonus of one day's pay to each employee who worked a full 10 days in a fortnight in which the colliery was in production for 10 days. As soon as miners had qualified for the bonus,

the Coal Miners' Federation called stop work meetings in protest, with the result that, on one day, 92 collieries were on strike with a loss of 43,000 tons of coal. A series of one-day strikes then followed, the loss from seven such strikes being 540,000 tons in New South Wales alone. These tactics were finally abandoned.

The most serious aspect of the coal situation is in the mechanical working of pillar coal, which is strenuously opposed by the unions on the grounds that it is unhealthy and unsafe, but in none of the inquiries into mechanical extraction of pillars have the unions produced any evidence in support of these contentions. They do not, however, object to extraction of pillar coal by much more dangerous hand methods, which carry high rates of pay in the few collieries which can afford to work pillars by hand. Lock-up of coal in pillars on the New South Wales fields is 240,000,000 tons, for which lock-up the miners' unions are solely responsible.

The seriousness of the position and the illogical obstruction by the miners is now being stressed by some of their leaders. At a recent conference of unions, this opposition was re-affirmed, but with the proviso that the miners would be prepared to confer on proposals for conservation of coal and extraction of pillars, provided there were adequate safety facilities, adequate pay, and a system of stowage for roof support. There is wide difference of opinion amongst engineers on the need for stowage in pillar extraction, except in some special cases. Such pillar working as has been done, even in the 25 ft. thick Greta seam, has been safely and successfully carried out—by hand labour—without stowage, and some mechanical extraction in a South Coast mine was in progress for several years before banned by the union.

MECHANICAL EXTRACTION OF PILLARS RECOMMENDED

The present position is that the Coal Conservation Commission has recommended mechanical extraction of pillars, and that power has been given to the Coal Industry Tribunal to enforce its awards and orders. The unions will now be under the jurisdiction of the Tribunal which will have power to punish in cases of wilful insult, disturbance, or interruption of proceedings—a measure of discipline long overdue.

There is a probability that experiments in mechanical extraction of pillars, in conjunction with stowage, will be carried out in the Greta seam, but it would seem that the matter of stowage will be largely a palliative to the unions, and an expensive one to consumers, in order to secure the utilization of the large—and deteriorating—lock-up in pillar coal.

U.S. Coal Gasification Experiments

Experiments on the underground gasification of coal are now being conducted in several countries including the U.K. and the U.S., where the Bureau of Mines has been carrying out a series of tests over the past four years in Alabama. As a result of these tests, which included the burning of some 10,000 tons of coal during a period of 22 months, the Bureau is now convinced that the method has great possibilities. In some cases, the heating value obtained from the coal in this way is stated to be so high that the yield is better than if the coal had been mined in the ordinary way and burnt above ground. The Bureau also hopes to use the method to produce gases which may be used to make synthetic fuels and chemicals.

AMERICAN COAL MINING INDUSTRY—II

Production Methods and Machines in the U.S. Coal Industry

In the first article on the American Coal Mining Industry which appeared in our issue of December 28, it was pointed out that the British productivity team which visited America last year attributed a large measure of the success achieved by the U.S. coal industry to the belief shared by management and miners alike that staying in business meant producing more at less cost. That this attitude prevails throughout the industry is an excellent tribute to U.S. management practice. But lest anyone should draw the conclusion that all that is needed in the British industry to produce another 50,000,000 tons or so is a change of heart, the team go out of their way to stress the fundamental importance of the fact that whereas our known coal reserves are limited theirs are virtually inexhaustible, and that the natural geological conditions in which their coal is found are so superior to our own as to invalidate comparison. In the article which follows, based on the team's report, the natural conditions in which the U.S. coal miner finds his coal and the production methods and machines which he uses for its winning, are described in some detail.

Central to the task of understanding why and how the American coal mining industry is able to achieve such a high average output is the realization that the American industry has taken shape on the assumption that coal reserves are virtually inexhaustible. One computation has put reserves as high as 2,700,000,000 tons—enough in theory to last for several thousand years. In Britain, known coal reserves are estimated at some 43,000,000,000 tons. With such a huge supply margin, American mining is selective, only the best and most easily accessible seams being worked. This also accounts for the low recovery rates in comparison with British standards and for the policy of leaving coal in the ground wherever high rates of extraction are incompatible with high productivity. On the other hand, some anxiety does persist in the U.S. about the value as opposed to the volume of the reserves and many companies are making every effort to improve their extraction rates.

It is, however, when the report describes the differences in the natural conditions in which the coal is found that the factors favourable to a high average output are most clearly seen. In general, the bituminous coal seams in the U.S. lie at shallower depths than in Britain and lend themselves more to opencast working which, at present, accounts for over a fifth of the total of American production, and this proportion is increasing. The average shaft working depth in the U.S. is 190 ft., the deepest shaft being no more than 839 ft. (In Britain, the average working depth is about 1,170 ft. and some shafts are as deep as 3,000 ft.) Seams frequently outcrop in the valleys making for easy access by entries driven in the coal itself, thereby facilitating the adoption in many mines of the simplest, cheapest, and most efficient haulage systems. Furthermore, the seams are remarkably free from major faulting and the average thickness worked is 5½ ft., which is much greater than in this country. Depth is also a major factor influencing the system of working. All the seams worked in the U.S. lie at a depth at which the room-and-pillar system can be practised. This system was originally used in this country, but as the shallower seams became exhausted it was generally discarded in favour of the long-wall advancing method.

The principles of room-and-pillar working are well known in this country and its advantages and disadvantages compared with the longwall-advancing system were fully set out in the Reid Report of 1945. For this reason the report does not describe it in any detail, but since the team believes that American practice has improved upon the traditional room-and-pillar system,

the most noteworthy of these improvements are given in this report and are as follows:—

1. In the driving of multiple headings, the number of parallel roads advancing together towards the boundaries may be as high as 12. Each unit is, from the outset, an economic producer which greatly offsets one of the principle drawbacks of the system as originally practiced, namely, that there was a time lag before capital expenditure showed any return.

2. The employment of intensive mechanization, particularly in the cutting and loading operations, to increase the speed of driving these multiple headings makes possible the rapid development of mines and the extraction of pillars soon after they are formed. As originally practised, headings were driven by hand, which meant not only hard and monotonous work, but also a long delay in the return.

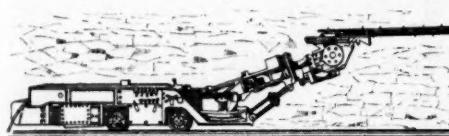
3. By giving careful attention to the line of retreat of the pillars and rigidly maintaining that line, crush on the pillars is considerably reduced and they are more easily extracted by machine.

In 1900, a quarter of the American output of bituminous coal was cut by machine. By 1947, the peak year of American production when 400,000 men produced a record output of 560,000,000 tons, cutting by machines had risen to 90 per cent. This meant that some 14,500 machines were in use, each cutting about 26,000 tons a year. In the early 1920's, a difficult period for both the British and the American industry, engineers in the United States turned to mechanized mining as a means of increasing productivity. At first progress was slow. In 1923, less than 1 per cent of the total underground production was mechanically loaded, but in the five years before the outbreak of the last war, the proportion rose to 21 per cent. Since the war, the rate at which these machines have been put to work has been greatly accelerated. By 1949, no less than 67 per cent of the total output was mechanically loaded and the proportion is said to be increasing by about 2 per cent annually.

SEQUENCE OF OPERATIONS

The sequence of work in American mechanized headings conforms to orthodox procedure.

1. To undercut or overcut the coal by machine to a depth of 9 to 11 ft.
2. To drill the necessary shot-holes in the coal.
3. To break down the coal by explosives or other means such as cardox or airdox.



Joy 7—AU Track Mounted Coal Cutter

This cutting machine of the universal arc-type is in current use in America and is shown here to give some idea of the extent to which cutting operations have been mechanized

4. To load the broken coal by mechanized loaders into mine cars, shuttle cars, conveyors, etc., which bridge the gap between the loading machine and the main haulage system.

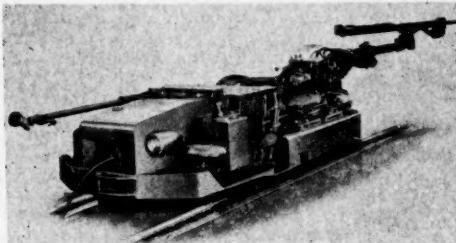
5. To set the necessary timber or roof bolts to support the roof in the working place.

The only aspect of this procedure which the team felt called for special comment was timbering. In every mine visited, timbering was done after the coal was loaded out so that the loading operation was not interrupted. Nor were the men working the mechanical loader under the newly-exposed roof.

The size of the crew varies with the type of equipment and the number of places worked, but a typical crew in trackless mining can be taken as consisting of 12 men, two cutting machine operators, two drilling machine operators, one shotfirer, two loading machine operators, two shuttle car operators, two timber men and one section foreman. With a crew of this size working in coal of average section it was possible for them to cut, size and load as much as nine, ten or eleven times in a shift and deliver to the mine haulage upwards of 310 tons, or about 26 tons per man. However, output performance varies from mine to mine and at the mines visited working the room-and-pillar system, face output ranged from 8 to 35 tons per man.

MECHANIZATION AT THE COAL-FACE

Mechanization of work in the headings depends for success on close teamwork and a high standard of maintenance. Where these are lacking in even one unit of the



Track-mounted Jeffrey 56-FH Drilling Machine

This machine is here illustrated as another example of the way in which mechanization has replaced the hand winning coal in America

team, the whole section is disrupted. To insure against this, elaborate control methods have been devised, ranging from close personal supervision and daily cost checks to a detailed analysis of the performance of the machines. Despite this close control, the Americans are not getting optimum results from their existing combination of men and machines. Some feel that the fault lies on the management side, while others feel that the root of the matter is better maintenance to give greater machine operating time per shift. But most believe that neither management nor miners can do much more with the existing types of machines and that the long-term answer lies in the development of a new combination machine, or combination of machines, capable of breaking the coal from the face and loading it into the transport system in a single operation. In this way, the orthodox cycle of cutting, drilling, shooting, and loading would be eliminated.

Although there are 12 different types of continuous miner in existence in the United States, the team were able to see only three, the Joy, the Jeffrey "Colmol" and the McKinlay Entry driver.

The Joy continuous miner is in operation at Donnistorpe Colliery in the East Midlands Division and a des-

cription of this machine and some performance characteristics were given in *The Mining Journal*, July 13, 1951.

The Jeffrey Colmol (which the team saw in a factory and not in a mine) also moves under its own power on caterpillar tractors. In 4 ft. thick coal it can advance a place 9½ ft. wide at the rate of 18-24 in. per minute. The machine operates a series of rotary breaker heads, each having wide-spaced and progressively receding teeth that chip the coal in overlapping annular concentric kerfs. Half the heads turn clockwise and half anti-clockwise. The lower set also act as paddles to sweep the floor of the

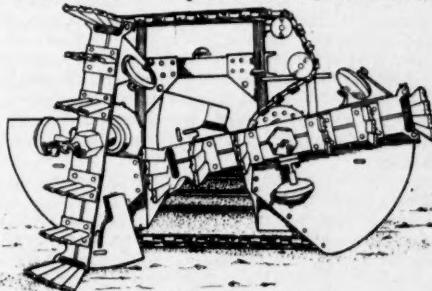


The Jeffrey "Colmol" Continuous Miner

seam in conjunction with a floor-shearing blade. The coal as it is broken from the face is thus swept to a conveyor which carries it to the rear of the machine. Less than 1 per cent of spillage is left. The advantages of the Colmol are, first, the action of the breaker heads fractures the coal at its cleavage points and ahead of the bits—the coal is not milled out by actual contact of the bits, but is chipped out by fragmentation; secondly, no part of the heads touches the perimeter of the passage-way cut by the machine, which therefore moves freely into and out of the path it makes. There are "high—" and "low-coal" models, varying in the number of rows of breaker heads. All controls are hydraulically operated. Production figures quoted were 210 tons in 5½ hours at the face, with the machine working 41.6 per cent of the time.

The McKinlay Entry Driver (which unfortunately was not working when the team saw it) is track-mounted and consists essentially of two auger heads fitted with cutting edges which rotate in opposite directions. Sides and roof of the arched drivage that it forms are particularly smooth and strong. The coal is broken down into fairly large sizes and production rates are in the range of 2½ to 4½ tons a minute.

The Joy "Walking Type" Continuous Miner is an adaptation of the Joy continuous miner and has been designed to work in thin seams. Its overall height is only 24 in.: it can mine seams up to 48 in. thick, and cut rooms



The McKinlay Entry Driver

above a minimum of 11 ft. wide at a rate of one ton a minute. It is carried at the rear on rubber tyres and at the front on a shoe, and "walks" or advances in short steps to keep up with the advancing face. The front shoe is equipped with jacks to swing the miner from side to side.

The coal produced by existing types of continuous miner contains up to 40 per cent of minus $\frac{1}{2}$ in. coal. The following figures, taken from the results of tests carried out at one of the mines visited, were said to be typical of experimental performance:—

Size Analysis	Continuous Miner Per Cent by Weight	Whole Mine Per Cent by Weight
Plus 4 in.	3.2	14
4 in. x 2 in.	14.2	18
2 in. x 1 $\frac{1}{2}$ in.	16.3	13
1 $\frac{1}{2}$ in. x $\frac{1}{2}$ in.	32.2	27
Minus $\frac{1}{2}$ in.	34.1	28

One of the major problems in the development of continuous mining machines is thus to prevent excessive size degradation and later designs are said to have improved performance in this respect. While the team were not able to inspect them they were given brief particulars of two of the experimental models.

The first model was a machine consisting basically of three parts; a main caterpillar-mounted chassis, a cutting-and-loading element and a rear conveyor. Both cutter and conveyor are capable of swinging through an arc of 90°. The mining head consists of a cylinder held between two parallel arms and driven by cutter chains. The cylinder carries five equally spaced cutting discs, each incorporating bits. Between the discs there are cone-shaped roller wedges to "wedge off" the cores made by the discs. The headumps in at the roof and cuts downwards. Half the mining is accomplished by cutting out 4 $\frac{1}{2}$ in. wide kerfs and half by wedging, an operation which, the manufacturer claims, "reduced the percentage of fine coal, which seems to be the objectional condition in various types of combination machines." Each cut is 42 in. wide and 18 in. deep, and production rates up to 13 tons a minute are attainable in coal of average section.

The other model was also a three-part machine but mounted on a four-wheeled rubber-tyred chassis, with flexible-type conveyor and gathering head. This head also embodies five cutting wheels or discs, mounted so that they oscillate to cut diagonally-intersecting kerfs. The diamond-shaped projections thus produced at the face of the coal are easily broken off by bits as the unit advances. Loading rates of the order of 1 $\frac{1}{2}$ tons a minute have already been achieved and the fines content is said to be considerably reduced.

TRANSPORT FROM CONTINUOUS MINING MACHINES

By welding the so-called auxiliary operations into a single process, continuous mining, the report states, changes the character of many of them. American mining engineers believe that the greatest modification that must be made is in the transportation system between the continuous miner and the conveyor belt or mine car. So far it would be true to say that continuous mining is a misnomer. Machines theoretically capable of producing upwards of 100 tons an hour overtax conventional gathering systems, so that a large part of their capacity, and of the heavy capital expenditure it represents, are unused.

Among the variety of methods tried to secure an uninterrupted flow of coal, the most common is to use a pair of shuttle cars so that the first is stationed immediately behind the miner and acts as a storage hopper or surge bin, discharging into the second, which trams to the belt or loading station. This method has the advantage that the shuttle cars can move under their own power when the miner is transferred from one heading to another, but it is still essentially intermittent. It is also difficult to keep the surge car directly behind the miner when the discharge conveyor is swung; and, where floors are soft, there is the problem of "bogging down."

A second method is to use caterpillar loaders with the

continuous miner. By this method the continuous miner spills the coal directly on to the floor. A mechanical loader picks it up and loads it into a shuttle car for transportation to the main haulage. The miner is to a certain extent independent of the transport system, but is still limited by the capacity of the loader. There is also the disadvantage that on soft floors dirt is picked up with the coal.

Shaker conveyors in conjunction with duckbills are also being tried. There is a new design of extensible trough made of special light alloy, steel or aluminium which reduces the weight by 25 per cent. This extensibility allows the miner to advance 26 ft. before it is necessary to add troughs to the pan line; quick-action clamps, in place of bolts, cut down the time taken to add a new length.

For lengths up to 400 ft., this method provides effective continuous transportation and the capital cost is less than half that of the shuttle car and mechanical loader systems. It rapidly loses efficiency, however, if adverse gradients are encountered and has the additional disadvantage that complete dismantling is necessary when the miner moves to another place.

NEW TRANSPORTATION DEVELOPMENTS

Several new developments are also in hand in "continuous" transportation.

One system is to couple together belt conveyor units, each 15 ft. long, into belt conveyor trains. Each unit is mounted on pneumatic-tyred wheels and carries a 2 h.p. motor for the belt drive and a $\frac{1}{2}$ h.p. motor for tramping. In experimental models the belt is 24 in. wide, with a maximum speed of 400 ft./min. and a capacity of nearly 4 tons/min. The units incorporate a steering mechanism so that each section follows exactly the path of the leader: the whole "train" is thus able to snake round room necks while the machine is advancing and it can also be used efficiently in pillar extraction on the retreat.

Several types of extensible conveyor are also being tried out. One described to the team consists of a strip of stainless steel, $\frac{1}{8}$ in. thick and 36 in. wide, forming a shaking pan line up to 600 ft. long. This whole length can be wound into a coil 26 in. in diameter; like an extensible steel rule, it coils flat but "troughs" when unwound.

The conveyor is mounted on slides and the shaking motion is imparted by a standard shaker drive. Its free end is attached to a set of track-mounted crawlers which follow the continuous miner and pull the strip from the storage coil as it advances. This unit will deliver nearly 2 tons a minute for lengths up to 300 ft.; beyond that the rate tends to decrease but this is regarded as a teething trouble. Several refinements are necessary before the units go into production, but it is not too early to consider their application. Cost is not expected to be higher than that of a large shuttle car. (It is understood that the National Coal Board has ordered one of these machines.)

These, then, are some of the types of machines that the Americans are developing to suit their own particular geological conditions which, as has been pointed out, differ greatly from those in Britain. While, therefore, there can be no question of installing these machines in a wholesale manner in British pits, there are, as the Donnithorpe experiment has shown, and as the report points out, coal areas in Britain in which modern American face equipment can be put to work effectively. The team recommends that where these areas do exist, they should be sought out and the complete system (including, for example, suitably modified controls upon operating efficiency) introduced as soon as possible. For those areas not fully suited to room-and-pillar methods, it is recommended that they might possibly be developed more rapidly by adopting the American practice of driving multiple entries in the seam. However, before these recommendations are introduced, the team recom-

mends that personnel, who would be selected for their ability, in the first instance, to educate others, should be sent to study American practice at first hand.

Finally, the team states that while the problems of completely mechanizing longwall mining in this country are less tractable, they are not technically insoluble. Thus

they recommend a concerted drive to bring to longwall working the degree of mechanization achieved by the Americans in room-and-pillar mining; and that the National Coal Board should intensify its efforts towards the development of new machines and techniques and to stimulate harness and reward local inventiveness.

Percival Norton Johnson

In the Biography of a Pioneer Metallurgist, *Percival Norton Johnson*, which is reviewed in the following article, the author, Mr. Donald McDonald, has brought back to light a most interesting personality, a pioneer of importance in more than one field, and a founder of a great business—now Johnson Matthey & Co. Ltd. This beautifully produced, illustrated book has been published by Johnson Matthey & Co. Ltd., 23-83, Hatton Gardens, London, E.C.1, and is available to the public upon application to the company at the price of 30s.

In this record which the author, Mr. Donald McDonald, the managing director of Messrs. Johnson Matthey & Co., describes as "the biography of a pioneer metallurgist," a valuable and fascinating account is given of the development of metallurgical progress in the City of London and incidentally of the growth of the great firm of Johnson Matthey & Co. from around 1820 till Mr. Johnson's death in 1866. The history of the period has largely disappeared apart from what is, as the writer observes, "embalmed in the files of *The Mining Journal*" which first made its appearance on August 29, 1835. Previous to that Mr. Johnson was obviously in pretty close contact with our founder and first Editor, Mr. Henry English, to whose earlier works—a compendium of companies formed for working British and foreign mines and his quarterly *Mining Review*—the author pays tribute.

Mr. Percival Johnson was born in London in 1792 being the son of John Johnson the only commercial assayer of ores and metals in the City at that time. The subject of this biography started an independent business in 1817 in Maiden Lane, Wood Street, E.C., describing himself as a "practical mineralogist" or in practice a geological and mineralogical adviser to mining prospectors. In 1822 he acquired the lease of 79 Hatton Garden, thus initiating a business which grew into the world famous firm of Johnson Matthey & Co. on the premises which it has occupied ever since.

Mr. Johnson early developed contacts on the Continent of Europe notably with Dr. Geitner of the Blaufarbenwerke at Schneeberg and with the princely family of the Demidovs, who in the first half of last century controlled so much of the mining in the Urals, whereby the firm was to secure a leading influence in the platinum industry and become independent of the rather restricted supplies available from Colombia, the then only source of supply.

FIRST MAN TO REFINE NICKEL IN ENGLAND

There are many instances of the initiative which Mr. Johnson displayed in forwarding the science and art of mining and metallurgy. He is credited with being the first man to refine nickel in England about 1829. He early recognized the notable proportion of palladium contained in the Gongo Soko gold exported from Brazil by the Imperial Brazilian Mining Association, at that date one of the largest known gold producers. At that period palladium was a little known metal though already esteemed in the construction of astronomical, nautical and experimental instruments. Mr. Johnson was successful in working out a process for separating the gold from silver and the associated rare metals and thereby overcoming the opposition of the Mint and Bank of England to the acceptance of Brazilian gold at the standard price. It is interesting in these days when so much is being heard of uranium minerals in connection with atomic energy, to read that

the firm was doing a growing business in the extraction of uranium oxide from pitchblende from Joachimsthal as early as about 1830. Many more interesting items regarding the progress of metallurgy as well as connections with well known City names may be gleaned by the reader but cannot be noticed here. Unfortunately the present work being confined to the life and work of Mr. Johnson later developments in connection with the firm of Johnson Matthey & Co. are necessarily excluded though we may perhaps hint a promise of more to come in the reference to the unpublished memoirs of Col. Edward Matthey and a history of the business [J. M. & Co.] by the late Mr. R. M. N. Dawlings.

JOHNSON AND WEST OF ENGLAND MINING DEVELOPMENT

It is probably not generally known to-day what an important part Mr. Johnson played in the history of West of England mining and smelting from around 1820 to 1850. Besides his important technical advice he was the Assay Master of Gwennap Tin & Copper Co., the Tywarnhale Mining Association, The West of England Cobalt and Copper Company and a director among other mines of Tincroft, East Wheal Strawberry, Polbreen, Perran Consolidated, Redmore Consolidated, Drake Walls, the Mendip Hills Mining Co. and the Silver Valley and Wheal Brothers Co. In addition he reconstructed and modernized the Tamar and the Union smelting works which at one time treated ores not only from Devon and Cornwall but from Wales, Brittany, Sark, the Isle of Man, Ireland and Australia. He also introduced from Germany the first shaking tables to be installed in this country which have since been the backbone of most milling plants. Much may be learnt regarding Cornish mining development and practice during the period as a result of Mr. McDonald's researches into the work of the founder of their firm which otherwise could probably only be obtainable from researches into the contemporary volumes of *The Mining Journal*. Desire for quick dividends and impatience of expenditure on the smelter led to increasing friction between Mr. Johnson and his associates so that about 1852 a sale of the Tamar Smelter was forced and Mr. Johnson decided to give up his mining work.

It only remains to congratulate Mr. Donald MacDonald on successfully carrying through a task, which, while no doubt a labour of love, obviously entailed for him and his secretaries an immense amount of laborious research and harmonizing of fragmentary records and traditions, thereby rescued from oblivion the story of a pioneer in the history of the great XIX Century achievements of British commercial and technical genius. He has blazed a trail which it is much to be hoped may be followed by other great firms, who in their various spheres contributed to place Britain in the forefront of mining and metallurgical progress.

Exploration and Development in the British Solomon Islands Protectorate

By A. G. THOMPSON

The following article—the third in a series on the mineral wealth of the smaller and perhaps lesser known British overseas territories—gives details of the mineral resources of the Solomon Islands and of the formidable difficulties connected with their exploration. The first two articles in this series, devoted respectively to Bechuanaland and to Swaziland, appeared in *The Mining Journal* of December 21, and of December 28, 1951.

The Solomon Islands are situated in the Western Pacific to the east of New Guinea and extend in two parallel chains for about 900 miles from north-west to south-east. A British Protectorate was proclaimed over the southern members of the group in 1893. The Protectorate consists of six mountainous islands and many smaller ones closely adjoining them, the total land area being approximately 11,000 sq. miles. The islands are nearly all volcanic and are densely wooded to the summits, the highest point, in Guadalcanal, being about 8,000 ft. above sea level. The rainfall is one of the heaviest in the world. The islands are populated by Papuans or Melanesians, who are divided into a large number of tribes.

FORMIDABLE COMBINATION OF DIFFICULTIES

The mineral possibilities of the Solomon Islands are considered to be more promising than those of any other colonial territory of comparable size. There is no recorded production, however, and till the recent establishment of a Geological Survey, very little prospecting had taken place, although gold has long been known to exist in the islands. The lengthy period which elapsed before any systematic exploration was attempted was due not to lack of interest, but to as formidable a combination of difficulties as geologists have ever faced.

Apart from geographical and physical obstacles, such as long distances between islands, high rainfall, and dense jungles, prospectors were deterred by the savagery of the natives and their distrust of anything they did not understand—an attitude which, to some extent, still persists, and, in some parts of the country the islanders believe that any interference with their mountains or rivers will offend the spirits concerned, who will manifest their displeasure in unpleasant ways. Many years ago, a German expedition was massacred by the Solomon Islanders and till recently prospectors have been understandably reluctant to risk a similar fate. Exploration has, therefore, been on a very limited scale and prospectors have concentrated mainly on gold occurrences in the mountainous country near Honiara, Guadalcanal. Deposits of manganese are known to exist on Hansevo Island near Tulagi, but their extent has not yet been fully investigated.

Under the Colonial Development and Welfare Act, grants totalling £11,700 were made for the purpose of carrying out a preliminary survey in the Solomon Islands Protectorate. The scheme covers the period 1949-1952. A Geological Survey was established in 1950 with the appointment of Mr. J. C. Grover as Senior Geologist.

Mr. Grover has been carrying out his duties with energy and enthusiasm, despite all the difficulties with which he is inevitably faced. Until a steamer could be provided for him, the only means of travelling from island to island was by getting a lift from some member of the Administration whose duties happened to take him in the desired direction. Under such circumstances, it was not always possible to spend as much time on a particular island as was warranted by the difficult nature of the country examined.

On the technical side, the Survey has been hampered

by the absence of accurate topographical maps, but aerial photographs taken shortly after the war by the U.S. Army Air Force are now available and are proving to be of great assistance.

KNOWN MINERAL RESOURCES

Since the primary object of the Survey is the investigation of the mineral resources of the Protectorate, work has so far been largely confined to the examination of known and reported mineral occurrences. An occurrence of sulphur on northern Vella Lavella has been investigated in an area of extensive solfataric activity, but unfortunately the deposit is of no commercial importance. A map has been prepared of the manganese deposits on Hansevo and the ore has been sampled by pitting and trenching. It is recommended that further prospecting in the vicinity should be done by drilling, since the deposits are largely covered by a considerable thickness of weathered rock. The gold-bearing areas of the central Guadalcanal mountains have been visited and a small area of the Gold Ridge district has been mapped on a scale of 200 ft. to 1 in. Observations based on excavation work indicate that the area may be a potential source of gold production. The alluvial deposits of the Servohio River below Gold Ridge were examined, but in the absence of pitting and drilling data, their economic possibilities cannot be assessed. The Sutakiki River alluvium is limited in lateral extent and is not, therefore, considered worthy of development, but it is felt that the area should be examined further in view of the occurrence of quartz reefs with metasomatic replacement of the country rock.

WORK OF SYDNEY UNIVERSITY

The Director of Colonial Geological Surveys, Dr. F. Dixey, C.M.G., O.B.E., attaches great importance to the practical interest manifested in geological research in the Colonies by universities in Britain and the Commonwealth countries. A most helpful development of this nature was an investigation carried out recently in the Solomon Islands by a party of geologists from Sydney University under the direction of Professor C. E. Marshall. Working in close conjunction with the Government Geologist, the expedition concluded a partial survey of the islands of Ysabel and St. George and also worked in an area west of Honiara. The manganese deposits at Hansevo and Buena Vista Islands were examined. A full report of these studies, which were made with the assistance of a grant of £1,000 from the Colonial Development and Welfare Fund, is now being prepared by Professor Marshall. Aerial photographs indicated interesting sedimentary structures on the island of Malaita.

It is recognized that a true appraisal of the mineral resources of the Protectorate will not be possible until much of the fundamental geology of the region has been elucidated by systematic geological mapping. Sufficient has been achieved, however, to warrant the opinion that the mineral possibilities of the islands have become probabilities. A further grant is, therefore, contemplated and, no doubt, the unit will eventually be expanded by the appointment of additional staff.

TECHNICAL BRIEFS

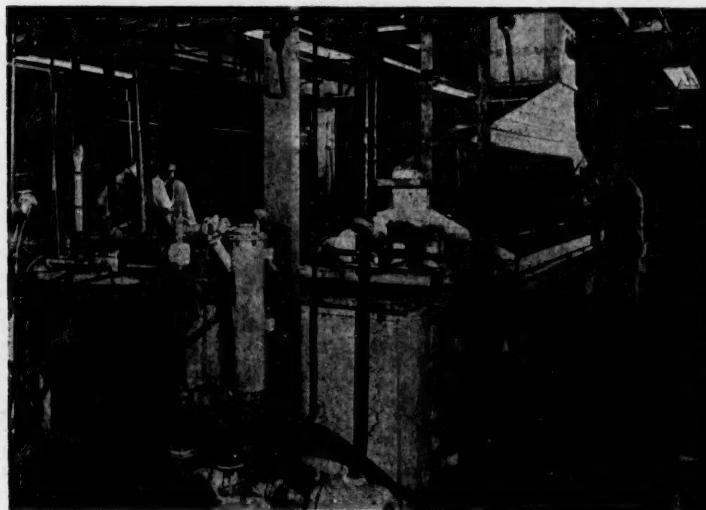
New Tin-Nickel Alloy Electroplate

In *The Mining Journal*, June 8, details were given of the new electroplate which has been developed by the Tin Research Institute and the December, 1951, issue of *Tin and its Uses* (issued periodically by the Institute) publishes a report on such progress as is being made towards transforming this new electro-chemical discovery into a world-wide industrial process. In this connection, it is pointed out that such delays and difficulties as have been met, lie not with the process or with the product, but with the materials and plant required.

At this time any process involving nickel has special difficulties, but as the new plate consists of two parts of tin and only one part of nickel it is, in fact, a method of making nickel supplies go further and this aspect is appreciated in government circles. A special difficulty arises, however, owing to the use of nickel chloride in the electrolyte. The demand for this salt in the past has been relatively small and it will not be freely available until more plant is installed by the makers.

There have also been problems in the matter of plating plant. Not every rubber-lined tank is suitable and samples of proposed linings should be tested to ensure that they do not contaminate the bath. On the other hand, a wider range of fabrics is being found suitable for anode bags than was originally thought and suitable pumps and filters for the continuous removal of foreign solids are being developed in order to improve the brightness of the deposit.

There are now six commercial plants in operation or being built in England and about 50 small-scale baths are worked by industrial firms up and down the country. Plants are also working in Spain, Switzerland, Denmark and Belgium, and will shortly be available in France and Holland. In the U.S.A., the official attitude that tin is scarce has delayed progress, but several experimental plants have been set up and the product is being studied for many uses.



A large tin-nickel plating bath now in commercial use at the Ionic Plating Company, Ltd., Birmingham. In this plant the preliminary problems in adapting this new invention to commercial production are being worked out.

Meantime, the Institute's electroplating staff continues to gain experience by the continuous operation of its 140-gallon plating vat to meet demand for samples and the Institute's corrosion staff is accumulating data on the excellent resistance to tarnish and corrosion of the tin-nickel alloy plate on the base metals used in industry.

New Tungsten Machining Technique

The development of a new technique for drilling, grinding, turning, milling, threading and tapping tungsten metal, using ordinary metal-working machines, has been disclosed by Philips Laboratories Inc. of Irvington, New York, reports Reuter.

The technique, already used in producing the company's new line of tungsten L-cathodes for electron tubes, permits the machining of tungsten metal to tolerances comparable to those normally achieved with steel or brass. The new technique is expected to be applied in the production of parts required to operate at very high temperatures in a vacuum or in reducing or inert atmospheres. Up to now, it has not been possible to make complicated shapes of tungsten because of its brittleness and hardness.

Wheelabrator Replaces Acid Pickling at New Plant of Richard Thomas & Baldwins

Instead of acid pickling to de-scale hot rolled silicon steel a wheelabrator is now used at the new rolling mills at the Cookley Works, Brierley Hill, Staffs, of Richard Thomas & Baldwins Ltd.

Formerly, acid was consumed at the rate of one hundred-weight per ton of metal, but the wheelabrator uses steel shot which is fired on to the surface of the metal by special wheels and not, as in shot blasting, by a jet and compressed air.

Both sides of strip varying from 24 in. to 48 in. in width can be cleaned simultaneously. The strip is passed vertically through the wheelabrator chamber, which is provided with six 19½ in. diameter wheelabrator wheels, three

on each side of the main chamber. When the wheels are located on the same centre line, 24 in. strip can be passed through the plant at the rate of 40 ft. per minute. When the wheels are offset to give clean-in cover for the 48 in. wide strip, the throughput rate is reduced to 20 ft. per minute. Besides saving acid, the wheelabrator takes up less space and needs fewer hands to run it.

The plant, together with the coil winding machinery, takes up 120 sq. ft. as against 200-250 sq. ft. for a similar acid pickling plant. As regards labour, the wheelabrator needs three men as against four to five needed on an acid pickler of like capacity. Lastly, no ancillary equipment is required.

However, the new plant has not yet been working to sufficient capacity to justify a comparison of working costs, but it is believed that it will prove a more economical unit to run.

METALS, MINERALS AND ALLOYS

Reassuring news regarding the threatened strike in the United States steel industry with all that it would involve in the complex of American industry came out last week-end. Mr. Phillip Murray, the president of the C.I.O. United Steel Workers, has advised his union to refrain from a strike for 45 days from the initiation of hearings by the Wage Stabilization Board. This decision implies that some progress has been made in the initial approaches between the Union and the U.S. Steel and bears out the anticipation expressed earlier that the issues were too great to permit of such a strike just when the rearmament programme is likely to attain its maximum effort. Defence production this year in the U.S., according to Mr. Fleischmann, is expected to be double that of 1951 and the Great Republic was, he said, half way towards her defence goal.

Mr. Churchill is now engaged in talks with President Truman and his advisors and early reports indicate that the talks are proceeding in an atmosphere of good will. Whether, however, any specific outcome will be available at an early date is a more difficult thing to say.

COPPER.—Despite restrictions American copper disposals continue on a large scale. December sales are reported at 112,108 s.tons, with January bookings in the first four days given as 40,781 s.tons.

LEAD.—Mr. Fletcher (St. Joseph Lead Co.) in a review of the U.S. lead position at the end of the year estimated domestic mine output at around 390,000 s.tons, 10 per cent down from 1950; imports should be about 225,000 s.tons against 542,000 in the previous year; some 500,000 tons might be recovered from scrap as compared with 482,000 the year before. The total from all three sources he reckoned at 1,150,000 s.tons compared with 1,230,000. Pointing out that the quantity needed from a military standpoint was comparatively small he said it did not warrant Government control of the entire lead economy. Although the Administration was calling on all producers to increase output, and devising all sorts of expedients, as well as curtailment of uses, it had avoided taking the only practical remedy for curing the shortage—a free market.

The lead deposits found at Mestersvig, East Greenland, are now thought to be more extensive than originally hoped. In addition to the 400,000 tons first discovered, another 1,200,000 tons of ore are considered to lie in the surrounding districts, and a further deposit is believed to exist about six miles away. The prospectors claim that traces of wolfram and molybdenum have also been found. The plant to handle this ore will take about three years to build.

TIN.—The event of the week so far as tin is concerned has been the resignation of Mr. Stuart Symington head of the R.F.C. since May 4 last, announced at the end of last week. President Truman stated that the change was accepted strictly on Mr. Symington's own request but refused to say whether he considered a solution of the price dispute would be hastened by the change, adding that Mr. Symington's resignation had nothing to do with tin policy. Somewhat widely this development is believed to represent a victory of the American State Department over the R.F.C., and Mr. Dean Acheson the Secretary of State is reported as optimistic about the possibility of working out the solution of the dispute with Bolivia over tin prices. Possibly the reticence which is being observed is due to the likelihood that tin discussions may figure prominently in the discussions between the President and Mr. Churchill.

Meanwhile Señor Martinez Vargas, the Bolivian Ambassador in Washington, so well known in the past as a spokesman for the Patiño interests, has responded sharply to journalistic attack on the attitude of Bolivia though without adding much that has not already been said on behalf of his country. He suggested, however, that charges that Bolivia had defaulted on all its loans did not take into account the depression caused by the price offered by the R.F.C., adding that the acceptance of these prices would close down a good part of the Bolivian mines as it affected the whole economy of the country, lowered the standard of living, and was calculated to cause distress among the workers. Exports from Bolivia in November were again high at 3,071 tonnes bringing the 11 months' total to

31,236 tonnes against 27,558 tonnes in the same period 1950. Assuming that the tin has been sold and not partly put into stock at Pacific coast ports, these figures suggest that demand from other quarters than the U.S. has been sufficient to absorb the increased quantity.

Production of the Longhorn Smelter in December is given as 1,805 tons making the total production for the year 30,921 tons compared with 32,136 in 1950 and 36,053 in 1949. Production declined almost regularly throughout last year from the 3,211 tons produced in January. N.P.A. stocks of tin on December 1 last were reported as 19,512 tons in metal and concentrates.

The output of Indonesia last year is reported as 30,984 tons compared with 32,102 in 1950. Banka production was practically unchanged at 19,461 tons, but Billiton and Singkep were about 1,000 tons down at 11,523 tons. An Indonesian tin Mission is due in the U.S. towards the end of the month.

The Malayan output in November was 4,815 tons making the total for the first 11 months 52,178 tons against 52,838 tons for the same period in 1850.

The Hague office estimates world production in the first 10 months of the year at 137,000 tons and consumption at 116,400 tons. Straits shipments in December total 5,016 tons making the total for 1951 64,957 tons against 81,801 tons in 1950.

ZINC.—Mr. Charles Inc, of the St. Joseph Lead Co., has blamed government control as the cause of much of the zinc shortage in the United States and believes that free market conditions would soon have brought supply and demand into balance. Since prices were raised to 19.50c. in October, domestic production and imports have shown a markedly improving tendency, he stated. Domestic output of slab last year should be about 925,000 s.tons as against the 1943 peak of 990,000 s.tons. In the coming year a 1,000,000 s.ton output is expected. He considered there was every prospect that in the foreseeable future zinc supplies would be adequate for every need. The quotation for Mexican metal has been lowered to 26-26.50c. nom. f.a.s. Gulf Ports.

ALUMINIUM.—Evidence that the expansion of the aluminium industry, especially in the United States, is proceeding with giant strides is indicated in a statement by Mr. I. W. Wilson, president of Alcoa. His company is now engaged in increasing its producing capacity by 55 per cent with the expectation that in the Spring of next year the capacity will be enlarged by 205,000 s.tons. Private industry is to expend more than \$500,000,000 on increasing output of which Alcoa will contribute \$300,000,000. The expansion will include two pot-lines at Point Comfort, Texas, relying on natural gas to generate electricity; at Wenatchee, Washington, there will be a four pot-line plant; and at Rockdale, Texas, another smelter of the same capacity utilizing lignite for a steam electric station to yield the necessary current. At the present time the whole of the company's production is geared to the defence programme and Government agencies have allotted consumers more aluminium than is being currently produced. The output of primary metal last year is estimated at around 837,500 s.tons, an amount only previously exceeded in 1943. The world production should be 1,300,000/1,400,000 s.tons. As soon as possible requirements for civilian use will have to be met. Mr. Wilson gave some indication of the magnitude and variety of the military requirements and concluded that aluminium was more than ever one of the most vital military materials in the U.S. programme. Associated with Alcoa's huge increase in aluminium production capacity is the programme for conversion of bauxite to alumina. A new 400,000 ton plant should be in operation in the middle of next year at Bauxite, Arkansas, the E. St. Louis plant was practically doubled last year and the Alumina Plant at Mobile, Alabama is in course of big expansion to be completed late next year. U.S. imports of bauxite for the first nine months of 1951 are computed as follows: Surinam, 1,751,197 tons; Indonesia, 231,312 and British Guiana, 122,213 tons. U.S. domestic production for the whole of the year is expected to total around 1,800,000 tons.

TITANIUM.—The contribution of the Kennecott Copper subsidiary which is producing titanium ore will be increased when the processing plant at Sorel is extended. Present plans to complete a plant containing five furnaces will be doubled, and Quebec is expected to be the chief source for the 3,000 tons of titanium metal needed by the U.S. in 1952.

TUNGSTEN.—Reuters' agent at Lisbon reports that the Portuguese market continues to be fairly active, though dealers and exporters have exhausted their stocks and find it difficult to fill orders now being received from various quarters, more particularly France and Germany. Prices appear to be generally higher than the 485s. per unit of the British control.

PLATINUM METALS.—Mr. C. W. Engelhard, president of Baker & Co., Inc., in his annual statement anticipates that in the coming year the demand for platinum will continue to exceed supply but that the supply of most of the other associated metals seems adequate. In 1951 palladium was particularly in demand, and the consumption in the U.S. may have exceeded that of platinum, having, in addition to its extensive use in many branches of industry, gained favour as the newest precious metal for jewellery and adornment. To this advance the difference in price compared with platinum has no doubt contributed. U.S. imports of platinum were approximately 55 per cent from Canada, 35 per cent from the U.K. and South Africa, while Colombia supplied the balance of 10 per cent.

The London Metal Market

(From Our Metal Exchange Correspondent)

At the end of last week it was reported that Mr. Symington had offered his resignation as head of the R.F.C. and it was later confirmed that this had been accepted, and his successor is to be Mr. Harry A. McDonald. At the same time the Bolivian Ambassador had a meeting with President Truman and it was the combination of these two facts which caused the tin price to jump at the end of last week to a level which has been maintained since. The Singapore market also advanced to a greater extent than here in London, and for the time being it is no longer profitable to ship tin direct from Singapore to the London market.

There is no longer any doubt that the United States will now actively consider ways and means of re-entering the world tin market and it is considered possible that negotiations with the Bolivians will be re-opened as a first step, and the buying in the open market will only commence after agreement has been reached on the ore contract, but should the negotiations be prolonged then it will probably be necessary for purchases to start first. With the general situation in tin which still shows a surplus production over normal requirements of something like 20,000 tons per annum, it is not expected that there will be any large fluctuation in price provided the Americans enter the market at a suitable moment and in a quiet manner, and here in London it is considered that the best method of attaining these two ends is for the import of tin to be returned to those firms which have been in the trade for many years, and for the Government to control its distribution until such time as the flow of tin becomes even and of sufficient volume to fulfil all ordinary requirements. After that the trade should be left to itself with the Government buying a regular and small tonnage for stockpile purposes.

On Thursday the official close on the tin market was: Settlement price £960, Cash Buyers £957 10s., Sellers £960; Three months' Buyers £957 10s., Sellers £960. In the afternoon the market was steady. Turnover for the day was 335 tons. Approximate turnover for the week was 1,110 tons.

The Eastern price on Thursday morning was equivalent to £962 5s. per ton, c.i.f. Europe.

Iron and Steel

To some extent the agitation over the issue of the first of the iron and steel allocations has subsided. Anxieties persist, particularly amongst the industries which are not on the list of high priorities, but the Government statement has helped to clear the air. It has been made plain that the Defence programme and the export drive will exercise prior claims upon available supplies and it follows that other home consumers must bear the brunt of the cuts.

Allocations for the first period which ends on March 31 appear to be very restricted, but in case of hardship supplementary tonnages may be authorized. In any event consumers are assured that as soon as more steel is available allocations will be increased with, of course, some regard to national priorities.

The scarcity of scrap is still the most intractable problem confronting the steel industry. In other respects the outlook is more hopeful. True the improvement in coal supplies is only slight, but the position is better than had been anticipated and deliveries of both home and foreign ores are on the up-grade. This encourages the hope that some expansion of steel production may be possible in the near future.

In the meantime, however, deliveries of finished iron and steel products to home consumers are in arrears and shipments last month fell short of the export quotas. Buyers are scouring the market for any material which may become available before the Control comes into operation on February 4 but have met with scant success.

A decision on the future level of prices is also awaited with some anxiety. It is assumed that an announcement will be made before the rationing system comes into force, and in the meantime export prices of heavy steel products have been advanced by £5 per ton. No doubt the export price of small bars and sheets will also be increased since British prices generally are still below European levels and there is plenty of business on offer.

JANUARY 10 PRICES

COPPER

Electrolytic	£227 0 0 d/d
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(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid	£175 0 0 d/d
Soft empire, including secondary lead	...	...	...	£175 0 0 d/d
English lead	...	...	...	£176 10 0 d/d

ZINC

G.O.B. speleter, foreign, duty paid	...	...	...	£190 0 0 d/d
G.O.B. speleter, domestic...	...	...	...	£190 0 0 d/d
Electrolytic and refined zinc	...	...	...	£194 0 0 d/d

ANTIMONY

English (99%) delivered,	...	...	...	£365 per ton
10 cwt. and over	...	...	...	£290 per ton
Crude (70%)	45/50% nom. per unit, c.i.f.
Ore (60% basis)	45/50% nom. per unit, c.i.f.

NICKEL

99.5% (home trade)	£454 per ton
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OTHER METALS

Aluminium, £148 per ton.		Palladium, £8 10s. oz.
Bismuth, 28s. lb.		Platinum (scrap), £33.
Cadmium, 18s. 9d. lb.		Platinum, £27/33 5s. nom.
Chromium, 6s. 3d. lb.		Rhodium, £45 oz.
Cobalt, 17s. 6d. lb.		Ruthenium, £30 oz.
Gold, 248s. f.oz.		Quicksilver, £73 10s. £74 ex-warehouse.
Iridium, £65 oz. nom.		Selenium, 25s. nom. per lb.
Magnesium, 1s. 6d. - 2s. lb. according to quantity.		Silver (bar), 77d. f.oz. spot and forward.
Osmium, £35 oz. nom.		Tellurium, 19s. lb.
Osmium, £70 oz. nom.		

ORES, ALLOYS, ETC.

Bismuth	...	...	...	50% 16s. lb. c.i.f. 40% 14s. 9d. lb. c.i.f.
Chrome Ore—				
Rhodesian Metallurgical (lumpy)				£13 per ton c.i.f.
" " (concentrates)				£13 per ton c.i.f.
" " Refractory				£12 12s. per ton c.i.f.
Baluchistan Metallurgical	...			£13 18s. 6d. per ton c.i.f.
Magnesite, ground calcined	...			£26 - £27 d/d
Magnesite, Raw	...			£10 - £11 d/d
Molybdenite (85% basis)	...			103s. 1 <i>1</i> d. per unit c.i.f.
Wolfram (65%), U.K.	...			48s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture)	...			35s. nom. per lb. (home)
Ferro-tungsten	...			33s. nom. per lb. (home)
Carbide, 4-cwt. lots	...			£30 3s. d/d per ton
Ferro-manganese, home	...			£41 8s. 2d. per ton
Brass Wire	...			2s. 7 <i>1</i> d. per lb. basis.
Brass Tubes, solid drawn	...			2s. 1d. per lb. basis.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The biggest item of interest in markets this week was the announcement of the sterling area gold and dollar deficit for the fourth quarter of 1951. This comes out at the staggering figure of \$940,000,000. If the first capital and interest repayments on the U.S. and Canadian Loans are excluded, the deficit is \$764,000,000. While a heavy loss had been anticipated, many responsible quarters had not expected figures quite as bad as these. It should be noted, however, that the emergency cuts in imports announced by the new Chancellor after taking office have yet hardly had time to take effect.

Nevertheless it is now certain that further particularly stringent measures can be expected before long. A conference of all sterling area representatives will meet shortly to decide what lines these are to take. Further drastic cuts in the United Kingdom's dollar expenditure are inevitable. Some announcements are expected in February and Mr. Butler has stated that the budget will also be used to further this end.

The reaction of gilt-edged to this news was interesting. Selling did not materialize as expected, and bear covering even caused some small gains, although these were not wholly sustained.

The market in gold shares remained dull. Few investors will look at these to-day, although the premium price on the world's free markets has remained remarkably steady. In some quarters it has been suggested that 1952/53 may well be a "gold year," bearing in mind that markets try to anticipate 12-18 months ahead of events. The virtual disappearance of the premium on the U.S. dollar is causing anxiety to Canadian gold producers, and it is feared that some mines may have to close during the current year.

Kaffirs were a very quiet market. Prices generally declined due to lack of buyers rather than to any pressure of selling. Exceptionally, Doornfontein and West Driefontein improved following rumours of good developments. St. Helena and Welkom in the Orange Free State section started the period better on improved returns. Although both mines still report losses, better grade developments and decreased working costs

FINANCE	Price Jan. 9	+ or - on week	O.F.S.	Price Jan. 9	+ or - on week	MISCELLANEOUS GOLD (contd)	Price Jan. 9	+ or - on week	TIN (Nigerian and Miscellaneous)	Price Jan. 9	+ or - on week	
African & European	210	-1	Giltspoint	8/9	-1	G.F. Rhodesian	7/-	-1	Amalgamated Tin	10/3	-1	
Anglo-American Corp.	71	-1	H. F. S.A.	19/4	-1	British & Rhodesian	5/7	-1	British Tin	23/6	+6d	
Anglo-French	213	-1	Central Mining F.S.	4/1	-1	Malaya	2/4	-1	British	4/1	+1d	
Anglo Transvaal Consol.	37/6	-1	Fredrichs	8/9	-1	Mythe	1/6	-1	Ex-Lands Nigeria	6/3	+1/2d	
Camp Bird	12/10	+4d	Fredrichs N.	8/7	-1	New Guinea	4/4	-1	Gold & Base Metal	16/6	+1/3d	
Central Mining (1 fl shrs.)	39/4	-1	Fredrichs S.	9/7	-1	Nundydroog	6/9	-1	Geover Tin	4/7	+6d	
Consolidated (1 fl shrs.)	48/1	-1	F.S. Geduld	210	-1	—	3/-	-1	Jantar Nigeria	7/3	+3d	
Consol. Mines Selection	31/3	-1	Geoffries	21/6	-1	Orereum	13/3	+9d	John d'El Rey	11/3	-3d	
East Rand Consols.	3/4	-1	Harmony	23/3	-1	Orovile	38/11	+7d	Kaduna Prospectors	5/9	-1d	
East Rand Mining	4	-1	Hirschberg Estates	8/4	-1	St. John	40/6	-1	London Syndicate	6/6	+6d	
H.E. Prop.	36/3	-1	Midvale Wits	19/9	-1	—	—	-1	Ribbon Valley	1/1	-1d	
Henderson's Transvaal	13/3	-1	Ohate	40/7	-1	—	—	-1	United Tin	3/-	+1d	
Johnnies	3/6	-1	President Brand	18/3	-1	Diamonds	5 5/8	-1	SILVER, LEAD, ZINC	53/9	-7 1/2d	
Rand Mines	64/0	-1	President Steyn	16/6	-1	Casts	35/9	-1	Brook Hill South	4/-	-1d	
Rand Selection	43/11	-1	St. Helena	21/10	-1	De Beers Dfd. Bearer	44/10	-1	Burma Corporation	33/-	+16d	
Union Corporation	81	-1	U.F.S.C. & G.	8/3	-1	—	5/8	-1	Consol. Zinc	24/-	+9d	
Vereniging Estates	4/0	-1	Virginia Deb.	73	-1	De Beers Pfd. Bearer	73/8	-1	Mount Isa	48/-	-9d	
Writs	31/10	-1	Witbank	9/6	-1	—	15/4	-1	New Broken Hill	26/6	+3d	
West Wits	42/6	-1	Western Holdings	3	-1	—	18/4	-1	North Broken Hill	69/4	-7 1/2d	
Wits	—	-1	Western Holdings (New)	10/3	-1	—	22	-1	Rhodesian Broken Hill	21/6x	+6d	
GOLD			WEST AFRICAN GOLD			COPPER			SAN FRANCISCO MINES			
Blyvoor	43/3	-1	Amalgamated Banket..	1/10	-1	Chartered	69/11	-1	San Francisco Mines	35/6	+2d	
Brakpan	18/6	-1	—	1/3	-1	Indian Copper	4/1	-1	Trepcia	3/7	-1d	
City Deep	48/9	-1	Ariston	6/9	-1	—	—	-1	—	—	-1d	
Consol. Main Reef	38/9	-1	Ashanti	26/-	-1	—	—	-1	—	—	-1d	
Crown	3/6	-1	Biblanti	8/9	-1	—	—	-1	—	—	-1d	
Daggas	3/4	-1	Bremang	3/-	-1	—	—	-1	—	—	-1d	
Diamond Reefs	1/1	-1	C. & Main Reel	3/6	-1	Roan Antelope	14/-	-1	—	—	—	-1d
Doornfontein	24/-	-1	C. & Selection Trust	7/3	-1	Selection Trust	45/9	-1	—	—	—	-1d
Durban Deep	3/6	-1	—	3/74	-1	Tanks	51/3	-1	—	—	—	-1d
E. Daggas	23/1	-1	Konono	4/4	-1	Tharist Sulphur Br.	—	-1	—	—	—	-1d
E. Geduld .. (46/- units)	46/10	-1	Kwahu	1/9	-1	IRON (Ecuador)	—	-1	—	—	—	-1d
E. Rand Props.	3/6	-1	L'oudon & African Min.	1/10	-1	—	—	-1	—	—	—	-1d
Georgelief	10/1	-1	Lyndhurst Deep	1/6	-1	—	—	-1	—	—	—	-1d
Grooteveld	33/1	-1	Marlin	1/9	-1	—	—	-1	—	—	—	-1d
Libanon	10/1	-1	Naunawu	6/6	-1	—	—	-1	—	—	—	-1d
Lutjaars Vlei	13/7	-1	Taqah & Aboso	5/9	-1	—	—	-1	—	—	—	-1d
Marievale	21/6	-1	—	—	-1	—	—	-1	—	—	—	-1d
Modderfontein B.	4/9	-1	Boulder Perseverance	3/-	-1	—	—	-1	—	—	—	-1d
Modderfontein East	31/3	-1	Gold Mines of Kalgoorlie	12/10	-1	—	—	-1	—	—	—	-1d
New Kleinfontein	3/6	-1	Great Boulder Prop.	12/10	-1	—	—	-1	—	—	—	-1d
New Ross	17/-	-1	Great Western Consol.	5/74	-1	—	—	-1	—	—	—	-1d
Randfontein	16/-	-1	Great Western	16/6	-1	—	—	-1	—	—	—	-1d
Robinson Deep	13/3	-1	Lake View and Star	19/6	-1	—	—	-1	—	—	—	-1d
Rose Deep	32/6	-1	MOUNT MORIAN	17/8	-1	—	—	-1	—	—	—	-1d
Simmer & Jack	6/4	-1	Port Elizabeth	15/3	-1	—	—	-1	—	—	—	-1d
Springs	8/4	-1	Sons of Gwalia	10/9	-1	—	—	-1	—	—	—	-1d
Sub Nigal	21/2	-1	South Kalgoorlie	7/4	-1	—	—	-1	—	—	—	-1d
Van Dyk	21/2	-1	Western Mining	8/4	-1	—	—	-1	—	—	—	-1d
Van Heeswijk	22/2	-1	Wiluna	12/10	-1	—	—	-1	—	—	—	-1d
Vlakfontein	17/6	-1	MISCELLANEOUS GOLD			—	—	-1	—	—	—	-1d
Vogelskuil	27/2	-1	Cam and Motor	37/6	-1	Pengkalai	17/8	-1	—	—	—	-1d
West Driefontein	6 1/2	-1	Champion Reel	9/-	-1	Petaling	11/9	-1	—	—	—	-1d
W. Rand Consolidated	45/4	-1	Falcon Mines	9/7	-1	—	—	-1	—	—	—	-1d
Western Reefs	41/3	-1	Globe & Phoenix	23/3	-1	Siamsee Tin	24/4	-1	—	—	—	-1d
						—	—	-1	—	—	—	-1d
						Southern Kintas	16/44	-1	—	—	—	-1d
						Malayan	28/9	-1	Canadian Eagle Bearer	10/1	+2/3	
						Tromb	2/6x	-1	Mexican Eagle	26/9	+6d	
						Shell	4/3	-1	—	—	—	-1d
						Trinidad Leasehold	23/1	-1	Trinidad T.P.D.	31/9	+2/	
						Ultramar	29/9	-1	T.P.D.	33/9	+1/9	
								-1	Ultramar	34/6	+4/-	

were good features. Neither is yet on a full working basis and it is therefore far too early to form any judgment on the results. The shares finished the week erratically.

Platinums, mentioned in this column last week, again improved. This followed the publication of interesting figures and prospects by a leading financial weekly which had the effect of drawing public attention to the possibilities of shares in this section.

Cam & Motor, the leading Rhodesian gold producer, announced that they had acquired an option to purchase the Pickstone mine. This option expires at the end of January. The shares were unchanged following the news.

Tin shares in both Eastern and Nigerian sections were one of the brightest spots in the market. The price of the metal has recently improved, and the news of the proposed resignation of Mr. Symington, head of the Reconstruction Finance Corporation, has raised hopes that the U.S. policy of staying out of the tin market may soon be reversed. A feature in this section was the declaration of a final dividend of 18 per cent by British Tin Investment. This makes the total for the year 27 per cent compared with 19 1/2 per cent. The company holds substantial blocks of Malayan Tin shares but in recent years has considerably widened its portfolio and now has interests in copper, diamonds, zinc, etc. World tin production for October is reported as 14,300 tons and consumption as 11,500 tons. Clearly, much depends on the continuance of stockpiling and rearmament programmes.

Manganese shares showed resistance at lower levels and dollar issues, with the exception of gold, reacted to the increased pressure against sterling.

Wankie Colliery fell on renewed disappointment with the results, and doubts over implications of the Southern Rhodesian Government's request to have control of the company transferred to the colony.

Oil shares were good. Market circles anticipate prosperous trading conditions for the industry during the next few years, and there has been quiet investment buying taking place.

COMPANY NEWS AND VIEWS

Lake George Produces, Earns and Pays More

A greater production of lead, zinc and copper concentrates and increased recoveries of gold and silver by the operating subsidiary of Lake George Mining Corporation, combined with higher metal prices were responsible for the steep rise in the Corporation's revenue for the year to June 30, 1951. Yet, despite the bigger mill throughput mining, costs per ton rose by almost 20 per cent, due to higher wages and increased costs of stores and equipment. However, this figure does not include the rise in the production bonus from £A.3 11s. 4d. per week to £A.8 2s. 2d. per week which pushed up operating costs by no less than £150,956.

Year to June 30 Mined	Tonnage	Lead	Zinc	Copper	Silver	Gold	Mining Costs	
							(tons)	(tons)
1950	141,317	6,545	11,190	738	156,393	3,921	81	0
1951	174,790	7,841	13,533	854	184,880	4,392	100	7

*Excluding cost of bonus.

Nevertheless, group profits before taxation at £977,339 were almost double the previous year's earnings of £498,813. Shareholders came out well, 3s. 6d. per 5s. share being distributed as against 2s. in the preceding year. But no doubt many of them on reading that taxation liabilities were up from £294,845 to £619,742 will wonder why the company has not made application to transfer its seat of control to Australia where the tax burden is relatively light.

Year to June 30	Conc.	Gross Revenue	Operating Expenses	Tax	Dividend	Carry Fwd.	Dividends	
							£	£
1950	1,230,250	1,242,294	724,764	294,845	40	85,954		
1951	2,106,445	2,116,610	1,119,099	519,742	70	169,032		

Sir Godfrey Fell, chairman, in his address to shareholders makes no reference to the question of emigration but he does give positive evidence that good progress is being made at the operating mine and that the company is making every effort to catch up with its arrears of development work. In fact, development work went ahead satisfactorily last year, the total advance being 12,923 ft. or 2,080 ft. more than in the previous year. This enabled the measured ore reserves to rise by 234,174 tons to 1,784,300 tons in spite of the larger output.

Further good news given by Sir Godfrey was that the company was pressing on with its plans for exploring the ground beyond the existing ore bodies and that according to an eminent geologist the probabilities of discovering new ore bodies are good.

With base metal prices showing no signs of easing the outlook for the company remains bright although shareholders must bear in mind that during the current year profits will have to run the gauntlet, not only of income and profits tax, but possibly some form of excess profits tax.

G.C. Selection Looks Around

The Gold Coast Selection Trust report and accounts for the year to September 30, 1951, will give shareholders a good deal to think about.

The Company's portfolio is made up almost entirely of shareholdings in Amalgamated Banket Areas, Ariston Gold, Bremang Gold, Gold Coast Main Reef, Marlu Gold, and in the Ankobra River Power Company which interest was purchased during the year under review. At September 30, 1950, the book value of the company's shareholdings were recorded in the balance sheet at £1,590,910 compared with a market valuation of £1,917,903 thereby providing a paper surplus of £326,993, which, in the ordinary course of events should have given the company an ample margin to protect itself against an easing in the market values of its investments.

However, the past year has not been a good one for profitable share dealings and the trust has suffered along with other investors in the West African market. Just how much the depressed state of the West African gold share market has affected the Trust is clearly shown in the company's latest balance sheet.

Having acquired an interest in the Ankobra River Power Co. during the year under review, the book value of the com-

pany's investments might well have appeared in the balance sheet at £1,671,498, an increase over the previous year of £80,588. But the market value of the Trust's investments declined by no less than £452,810 which has led the Trust to write down the book value of its investments by £487,572, so that they now stand in the balance sheet at £1,183,926 (£1,590,910) or £281,167 less than their market value as at September 30 last. Thus, if allowance is made for the rise in the book value of the Trust's holdings the paper loss during the year would amount to approximately £533,000. Against this loss, profits on the sales of investments during the year brought in £19,449.

With the foregoing in mind, it does not come as a great surprise that the board has decided to widen the field of its interests if and when favourable opportunities present themselves. This envisaged policy of spreading its interests seems to be a sound one, for although the chairman, Maj.-General W. W. Richards, in his review circulated with the accounts stated that the scope for future activities in the Colony was by no means exhausted, the past year's experience presumably has been the decisive factor in causing the board to broaden the basis of its activities.

Such a policy demands considerable cash resources and with net current assets standing in the balance sheet at only £93,442 it is obvious that fresh capital will be needed to put this policy into effect. Accordingly, shareholders at the annual meeting to be held in London on January 15 next, will be asked to approve a resolution to increase the company's authorized capital from £750,000 to £1,000,000.

The financial results for Gold Selection Trust were given in our issue of December 21 last.

"Tanks" Continue to Forge Ahead

Increased dividend income and royalty payments from Union Minière on the one hand, and much lighter tax liabilities on the other, were the chief features of the report and accounts of Tanganyika Concessions covering the year to July 31 last.

The two sources of income from Union Minière, in which the Company has a large shareholding, are geared together and accounted for £1,252,660 (£795,384) of the total gross revenue of £1,272,302, which compares with £819,275 earned in the preceding year.

Year to July 31	Interest	Royalty*	Tax	Dividends		Profits Retained
				£	£	
1950	636,579	178,238	186,563	589,022	12	254,985
1951	978,968	292,865	66,955	1,101,776	25†	379,394

*Received from Union Minière.

†This included payment of a special interim dividend of 10 per cent paid out of Revenue Reserves.

The lighter taxation burden stems from the transfer of the Company's control to Southern Rhodesia during the year, the Colony's tax claim amounting to a mere £3,300 of the total liability.

The aggregate distribution on the ordinary stock was 25 per cent on an issued capital increased to £3,831,412 rising from the company's reorganization in the preceding year. Of this payment 10 per cent was declared as a special interim dividend and paid out of revenue reserves and therefore not subject to tax. Accordingly, the revenue reserves have been reduced by £201,149 but still stand at the appreciable figure of £782,392.

The chairman, The Right Hon. The Earl of Selborne in his review circulated with the accounts makes the interesting statement that "Tanks" hope to take an increasing part in the future development of the Rhodesias. While he gave specific details as to how this statement would eventually be translated into deeds, it would appear that to make a start on such a venture fresh funds may have to be found as at the date of the latest balance sheet, net current assets amounted to £88,218 after providing the advance to the Benguela Railway.

In any event the immediate prospects for "Tanks" look good. For the chief source of its income is derived from Union Minière and all evidence points to that company having another successful year.

December Rand Returns

Operating earnings last month of 35 mines were lower than in the preceding month, seven announced increases and the two O.F.S. producers worked again at a loss. Similarly 35 companies dealt with lower tonnages, six increased their throughput and three put through the same amount of ore as previously. Advance was shown in working costs; those on 34 mines being higher, seven were lower and two maintained the costs of milling at the level reached in November.

The only subsidiary in the Anglo American group to announce a lower costs unit was Brakpan, which dealt with a larger tonnage but profit was slightly less; that of "Sallies" was £337 higher although costs increased slightly and a lower tonnage was dealt with. Welkom put through 3,000 tons more and announced a loss which was £10,724 less than during its first month's run.

Lower tonnages were dealt with by all the "Corner House" members excepting Modder B, and profits were down in all cases.

Milling was below the previous month's level on all the mines of the Gold Fields group and costs were higher while only in the case of Robinson Deep was a better profit shown.

St. Helena was the only member of the Union Corporation to increase its tonnage (by 1,000 tons). The loss on the month's run was only a third of the £35,778 debit announced as the result of its first milling in November. Costs were 5d. higher at 50s. 1d. per ton.

All the "Johnnies" members announced higher profits although only slight; less ore was dealt with and costs were up, except in the case of Randfontein which were 4d. per ton lower at 27s. 9d.

West Rand dealt with the same amount of ore as previously but profit was £6,300 down and costs rose 1s. per ton. The other member of the General Mining group, S. Roodepoort, made a slightly lower profit. Rand Leases (Anglo Transvaal) dealt with a lower tonnage to the detriment of profit which was £8,900 down.

Blyvoor.—104,000 tons yielded 65,779 oz.; profit £586,323.
Brakpan.—114,000 tons yielded 21,406 oz.; profit £45,871.
City Deep.—155,000 tons yielded 31,791 oz.; profit £51,782.
Consol M.R.—186,000 tons yielded 25,571 oz.; profit £35,216.
Crown.—251,000 tons yielded 44,308 oz.; profit £50,494.
Daggafontein.—239,000 tons yielded 57,159 oz.; profit £415,986.
Durban Roodepoort.—175,000 tons yielded 30,576 oz.; profit £93,255.
East Champ d'Or.—30,000 tons yielded £61,164; profit £11,320.
East Dagg.—96,000 tons yielded 17,281 oz.; profit £71,401.
East Geduld.—140,000 tons yielded 42,004 oz.; profit £334,513.
E. Rand Prop.—211,000 tons yielded 44,313 oz.; profit £151,797.
Geduld.—102,000 tons yielded 14,820 oz.; profit £40,462.
Govt. Areas.—220,000 tons yielded £389,580; profit £50,311.
Grootvlei.—190,000 tons yielded 41,321 oz.; profit £260,202.
Libanon.—74,000 tons yielded 14,060 oz.; profit £30,208.
Luipaards Vlei.—95,000 tons yielded 17,754 oz.; profit £48,251.
Marievale.—59,000 tons yielded 14,669 oz.; profit £70,629.
Modder "B."—54,000 tons yielded 6,184 oz.; profit £7,986.
Modder East.—115,000 tons yielded 13,569 oz.; profit £29,072.
New Kleinfontein.—102,000 tons yielded 13,599 oz.; profit £35,036.

New Klerksdorp.—10,270 tons yielded £14,795; profit £1,282.
New Modder.—20,500 tons yielded 2,849 oz.; profit £828.
New State.—40,000 tons yielded £86,851; profit £1,048.
Nigel.—35,000 tons yielded 4,844 oz.; profit £1,816.
Randfontein.—338,000 tons yielded £495,568; profit £30,690.
Land Leases.—180,000 tons yielded £379,085; profit £72,934.
Rietfontein.—26,000 tons yielded 5,831 oz.; profit £28,051.
Robinson.—112,000 tons yielded 17,948 oz.; profit £9,260.
Rose Deep.—81,000 tons yielded 11,212 oz.; profit £14,125.
St. Helena.—41,000 tons yielded 7,305 oz.; loss £11,755.
Simmer & Jack.—126,000 tons yielded 20,131 oz.; profit £42,262.
S. A. Lands.—117,000 tons yielded 20,662 oz.; profit £87,168.
South Roodepoort.—26,000 tons yielded 5,791 oz.; profit £21,021.
Spaarswater.—10,200 tons yielded 2,320 oz.; profit £28,840.
Springs.—165,000 tons yielded 21,704 oz.; profit £25,621.
Sub Nigel.—64,000 tons yielded 22,512 oz.; profit £121,547.
Van Dyk.—100,000 tons yielded 15,106 oz.; profit £13,866.
Venterspost.—97,000 tons yielded 20,908 oz.; profit £55,035.
Village M.R.—34,100 tons yielded £66,320; profit £18,002.
Vlakfontein.—36,000 tons yielded 13,426 oz.; profit £77,327.
Vogelstruisbult.—76,000 tons yielded 19,760 oz.; profit £77,104.
Welkom.—33,000 tons yielded 3,323 oz.; loss £53,678.
Weldgedacht.—33,500 tons yielded 3,866 oz.; profit £4,010.
West Rand Cons.—210,000 tons yielded 33,231 oz.; profit £13,922.
Western Reefs.—110,000 tons yielded 23,229 oz.; profit £112,369.
Wit. Gold.—58,000 tons yielded £85,456; profit £2,555.

LONDON AND RHODESIAN MINING AND LAND CO.

The Annual General Meeting of London and Rhodesian Mining and Land Co. Ltd. was held on January 9 in London.

Sir Joseph Ball, K.B.E. (the Chairman), who presided, in the course of his speech, said:

The strengthening of the Balance Sheet has been carried a stage further during the year under review, by the transfer from the Profit and Loss Appropriation Account of a further £15,000 to General Reserve. This transfer increases the General Reserve to £100,000.

The book value of our holding of quoted securities also shows a further increase of £8,900 to £333,968, and it is satisfactory to note that at the close of the financial year, the market value of these securities was some £94,000 in excess of that figure.

With regard to the Profit and Loss Account, you will see that the revenue which arose in London is slightly more than double that of the previous year. The increase in this figure is due in the main to profits on share transactions, amounting to some £30,000, as against £943 in the previous year. This can, I think, be regarded as satisfactory, especially when considered in conjunction with the fact that there was also a market appreciation on the Company's quoted securities of some £94,000 over the Company's book value at the close of the financial year. It would not, however, be safe to assume that it will always be possible to repeat such figures during future years.

Despite necessary and unavoidable increases of expenditure in many directions, the Board have nevertheless found it possible to maintain the dividend at the increased rate of 6 per cent paid last year. This dividend will, as usual, be paid in February.

MINING INTERESTS

The Chairman then reviewed at length the various activities of the Company, including the ranching operations. Continuing he said:

To the particulars of our mining interests set out in the Directors' Report, it falls to me to add some information recently to hand respecting the Pickstone Mine—information which I hope and believe stockholders will regard as satisfactory.

As you know, the development of this mine was undertaken by London and Rhodesian on behalf of a syndicate, in which our Company has a 50 per cent interest, Coronation Syndicate a 25 per cent interest, and Sherwood Starr the remaining 25 per cent interest. For some time past, developments have been of a satisfactory nature, and the June 30, 1951, well over 100,000 tons of ore reserves of an average of 6.78 dwt. per ton had been proved, with indications of further satisfactory developments still to come.

At this stage, it was becoming necessary for the participants to decide upon the future of the mine. It had at one time been considered that they should retain ownership, and form a company to raise the very substantial capital which would be required in order to equip the mine with the plant necessary to bring it into full-scale production.

As Stockholders know, however, during the past year or two the cost of all mining equipment has already risen spectacularly, and prices seem likely to rise still further in the future.

PICKSTONE OFFERED FOR SALE

Consideration was therefore given to possible alternatives, and fortunately, one was ready to hand. Pickstone is situated within 17 miles of the very successful Cam and Motor mine, which is already equipped with a plant of a capacity amply sufficient to take the Pickstone production in its stride; and delivery of the Pickstone ore to the Cam and Motor plant could readily be effected by the construction of a light railway costing approximately £70,000 only, as compared with an expenditure of many times that figure for the installation of a complete reduction plant.

In the light of these facts, it seemed obvious that by far the best course from the point of view of the syndicate, was to offer the Pickstone Mine to Cam and Motor, on such terms as would provide the participants with a reasonable profit on their past risk expenditure, and which would at the same time afford Cam and Motor also an opportunity of making reasonable profit on whatever outlay on their part might be involved.

Negotiations were therefore opened between the representatives of the syndicate on the one hand and those of Cam and Motor on the other, and I am pleased to say that these have reached a satisfactory conclusion.

Cam has requested, and has been granted, an option to purchase the Pickstone Mine for the sum of £200,000 cash, exercisable on or before January 31; and I have very little doubt that the option will be exercised.

I may say that the figure of £200,000 was reached in the course of joint consultations between the technical representatives of Cam and Motor on the one hand, and those of the participants on the other, and that while it is clear that on this basis London and Rhodesian and the other participants would make a substantial profit on their investment, it seems equally clear that Cam and Motor should, in turn, also benefit substantially by their investment.

The report was adopted.

mysore gold mining co., ltd.

The Annual General Meeting was held at the Head Office of the Company, Oorgaum, Mysore State, South India, on 27th December, 1951. Mr. Arthur H. E. Tay or (Vice-Chairman of the Company) who presided, in the course of his speech said: The accounting period, which normally ends on 31st December, was extended by three months to 31st March, 1951, to cover a 15-month period. This extension was made in order that the date of the sale of the assets to the new Company should coincide with the date of the balance sheet, on the basis of which the sale was made. The milled tonnage of 201,786 resulting in the production of 65,153 oz. of gold compares favourably with the previous year, after allowing for the longer period. The average price received per oz. of gold at £22 13s. 9d. was 3s. 9d. per oz. lower than the average for the previous 12 months. The total gold proceeds amounted to £1,478,064, to which was added £1,493 in respect of the sale of silver. After deducting royalty amounting to £73,633 and adding £3,287 for rents, interest, transfer fees and sundry receipts, there was a total net credit to the revenue account of £1,409,211.

After deducting total costs amounting to £1,092,942, there was a balance on revenue account of £316,269 which was transferred to profit and loss account, where £4,833 was added in respect of dividends and interest on investments, and £3,909 the profit on sales of part of the Company's holding in Central Manitoba shares, bringing the total credit to the profit and loss account to £325,011. There was debited to this account £9,384 staff provident fund, £2,285 United Kingdom taxation on investment income there, and £163,941 representing 15 per cent of the costs, the amount transferred to the depreciation and development expenditure reserve in accordance with the agreement with the Government of Mysore, to leave a balance of £149,401 which was carried to the appropriation account.

After making a provision of £118,400 for reimbursement, to the new Company in respect of Indian income tax, 1951/52, and of £1,475 for under-provision for Indian taxation on 1949 profits, there remained, after providing for the dividend referred to above, a balance of £44,475, of which £40,000 was transferred to general reserve. This treatment of the balance was considered necessary in order to improve the financial position of the operating Company having regard to the fact that since the introduction of the Indian Income Tax Act to the Mysore State, income tax is payable in advance. As a result of this almost two years' tax will become payable in one year. For this reason, it is regretted that it has not been possible to make a distribution to the stockholders out of the profits earned during the 15 months to 31st March, 1951. The injustice of applying to the wasting asset of a mine the same principles of taxation as are applied to manufacturing industries still awaits recognition in the form of adequate relief, which will give the mining industry the incentive to expand and prosper. Your Directors are continuing to do everything they can to bring home to the authorities concerned the urgent need of the mining industry for special treatment in relation to taxation as is recognized by Governments in all other important mining countries. If it had not been for the serious fire which broke out in the mine on 7th November, 1950, which interrupted mining operations until 16th January, 1951, also the serious power cuts which occurred in April and May, 1950, the results of the Company's operations during the period under review would have been very satisfactory. The mine continues to prove that, given normal conditions, it has many years ahead during which profitable mining operations can be continued. The work of reclaiming old areas of the mine continues to provide considerable tonnages of payable ore for the mill, apart from the ore which is won from the payable reserves. Development results have been satisfactory with some interesting discoveries in the deepest levels of the mine. The important scheme for the extraction of the valuable ore in Edgar's shaft pillar is proceeding according to plan. During the next few years, and while this work is in the early stages, it is probable that the payable ore reserves will show some decline as the additions by new development will not make up the depletions by mining. However, as soon as ore from Edgar's shaft pillar becomes available, it will be added to reserves and will become an important and valuable source of ore for the mill. In the autumn of 1950, an agreement was reached with the Mysore Mine Labour Association whereby the dearness allowance was linked to the Kolar Gold Field cost of living index. The index has steadily risen since the agreement was entered into, and now results in a dearness allowance being paid to labour of nearly double that paid in August, 1950, the month before the new scheme was introduced. The first bonus, paid in March, 1950, was equal to 13 days basic pay and was awarded by a Court of Arbitration which closely examined the demands for bonus in January, 1950. The second bonus amounting to 26 days basic pay was paid to labour under the terms of an agreement arrived at between the Company and the Mysore Mine Labour Association in February of this year. A further demand for bonus is now being made, and in considering it the Board will give the fullest weight to the findings of the full bench of five judges of the Labour Appellate Tribunal referred to in the

1950 Labour Law Journal and to those of the Court of Arbitration set up in January, 1950, when basic principles were laid down on which to arrive at decisions on the question of bonus.

MANAGER'S REPORT

Mr. J. K. Lindsay: During the period under review which, as explained by your Chairman, is from 1st January, 1950, to 31st March, 1951, production was severely affected by a curtailment of electric power, and by a fire which broke out at the 48th level. Ribblesdale auxiliary main winze. The curtailment of electric power from the Government power station at Sivamudram lasted from 21st April, 1950, to 4th June, 1950, and resulted in a loss of 11 working days. To supplement the output 2,503 tons were milled from the stock-pile on surface during this period. The fire broke out on 7th November, 1950, and lasted until 17th January, 1951. During this period, except for 4,899 tons hoisted from unaffected parts of the mine, production was at a complete standstill. The remainder of the surface stock pile amounting to 2,973 tons was milled during the first week of the fire.

For the year ending 31st December, 1950, 163,400 tons were milled producing 54,221 f.oz., an increase of 7,880 tons and 2,904 f.oz. over the previous year. From 1st January to 31st March, 1951, 38,380 tons were milled producing 10,932 f.oz., making a total of 201,786 tons and 65,153 f.oz. for the 15 months period. On 31st March, 1951, the payable reserves were estimated at 261,200 tons at an average grade of 12.35 dwt. The reserves show a decrease of 24,600 tons, but the grade has increased by 0.44 dwt. per ton. In addition, there is a probable tonnage of low grade ore, computed at 28,900 tons. The development footage for the period under review amounted to 15,217 ft.

There has been a continued upward trend in production costs, due to rising prices, and to the necessity to increase the dearness allowance paid to workers. Production costs for the 15 months ending 31st March, 1951, amounted to 98s. 5d. per ton, compared with 90s. 9d. for the 12 months ending 31st December, 1949. Every effort is being made to offset rising costs, by increasing technical efficiency, and increasing output per man shift. Unfortunately, the stoppages due to shortage of electric power and the fire at the 48th level, prevented attainment of the full increase in output which it was hoped for.

A shortage of domestic water supply from the Government reservoir at Bethamangala which lasted from 1st November, 1950, to 27th May this year put both the employees and the mine administration to great inconvenience. During this period, water pumped from the underground workings had to be used for all industrial and domestic purposes. To enable this to be done, special chlorinating plant had to be installed at Edgar's shaft at a cost to the mine of Rs. 53,383.

The report and accounts were adopted.

THE CHAMPION REEF GOLD MINES OF INDIA

The Annual General Meeting was held at the Head Office of the Company, Oorgaum, Mysore State, South India, on Friday, 28th December, 1951.

Mr. Arthur H. E. Taylor (Deputy Chairman of the Company) who presided, in the course of his speech said:

As mentioned in the report, the accounting period which normally ends on 31st December was extended to 31st March, 1951, to cover a fifteen month period. This extension was made in order that the date of the sale of the assets to the new company should coincide with the date of the balance sheet, on the basis of which the sale was made. Even though this longer period be taken into account, that is to say if we reduced the amount by one-fifth, the gold and silver sale proceeds at £1,840,605 represent an all time high record.

The same remarks unfortunately apply to the total costs. While these record figures to some extent reflect the higher output of ounces which proportionately is the highest since 1943, they are to a large extent a measure of the inflationary trend of to-day. The increase in costs has taken place in almost every direction, but if you will examine the debit side of the revenue account you will see that one of the largest increases, both in percentage and amount, is in the payment of dearness allowance to labour, which in September, 1950, was linked to the cost of living index for this locality, and to-day results in a dearness allowance of nearly double that paid in August last year. In March last year labour was paid a bonus in respect of 1948 equal to half a month's pay, and in February of this year bonus equivalent to one month's pay was given to labour for the year 1949.

THE ACCOUNTS

To the profit on revenue account of £590,725 there was added in the profit and loss account, interest and dividends totalling £3,819. Against the total credit to this account, of £594,544, there was debited £7,905 staff provident fund, £1,742 for U.K. taxation on dividends and interest received there, and £144,179 transferred to the depreciation and development expenditure reserve which

was created in accordance with the terms of the new agreement with the Mysore Government, leaving a balance of £440,718 which was transferred to the appropriation account. In addition to this amount and the balance of £3,658 brought forward from the previous year, you will note there has been credited to the appropriation account a net figure of £17,024, being a sum equal to the dividend and percentage thereon paid out of the undistributed profit at 5th May, 1949, and shown on the debit side of the appropriation account.

Out of the total net credit to the appropriation account of £461,400, there has been provided for reimbursement to the new operating company £293,000 in respect of Indian income tax 1951-52 which will be met by that company, £5,867 for an under-provision for taxation in a previous year, and in addition to the dividend to which I have already referred, a dividend out of the 15 months profits amounting to £48,750 plus percentage £1,219.

The working of the Champion Reef and Ooregum mines as a joint operation continued throughout the period under review. This Company, however, is better placed than the Ooregum Company to meet the rising costs by reason of its ample reserves of ore and higher grade, and for this reason the financial aspects of the joint working, as they affect the two Companies, are now being examined by the Management. Many reforms have recently been introduced by the Central Government, with effect in the Mysore State, and we are constantly being faced with new forms of legislation with which we must comply, necessitating changes which in our opinion are not always beneficial to the industry or its employees.

You are aware that the mine has now reached great depths with the consequent technical problems inherent with deep mining, but these are being satisfactorily met by efficient working and the application of modern science. More difficult are the trends of inflation and changing conditions in labour and administration.

As to the future of your Company, so far as the mine is concerned developments continue to be satisfactory and output is likely to be maintained. The doubtful elements are those of costs, labour problems, and the price of gold, but much will depend upon the situation after the elections which take place early in January, 1952.

MANAGER'S REPORT

Mr. J. K. Lindsay, who addressed the meeting on behalf of the management, said: During the first six months of the period, operations at the mine suffered many serious setbacks. In the north section of the mine, operations were suspended for 20 days following an outbreak of fire. The necessity for renewing the drum bushes of Gifford's hoist caused a cessation of underground operations for a period of 14 days. A further serious interruption of operations resulted from a curtailment of the electric power supply from the Government power station at Sivasamudram which lasted from 23rd April, 1950, until 3rd June, 1950. During this time, a total of 11 working days were lost. However, in spite of all these difficulties and adverse factors, the tonnage milled for the first 12 months of the period rose to 133,800 tons producing 64,834 oz. from 99,240 tons producing 41,022 oz. in 1949. For the 15 months, the total tonnage milled amounted to 175,200 tons, producing 81,213 oz.

A considerable increase in development footage was also achieved, reaching a total of 9,663 ft. for the 12 months compared with 5,778 ft. for the previous year. This increase was well maintained for the remaining three months, the total for the whole period amounting to 12,772 ft. During the current period, the 95th level has been extended south with encouraging results. For a length of 108 ft., reef averaging 68.6 in. in width, assaying 8.8 dwt. per ton was exposed, thus confirming the continuity of the 93rd level discovery in depth. This is a promising discovery, and one which, it is hoped, will lead to a substantial tonnage of medium grade being added to the mine resources.

Development on the Glen ore shoot was continued at the 93rd, 94th and 95th levels, with satisfactory results. During the current period, development has been carried down to the 96th and 97th levels and the results are most promising.

In the Northern section, development on the main lode and folds was somewhat restricted due to the presence of a pegmatite intrusion and was confined mostly to the east limb of the fold from the 92nd to the 94th level.

The reserves of payable ore at 31st March were computed at 527,409 tons, at an average value of 11.47 dwt. per ton, as compared with 525,130 tons at 11.85 dwt. per ton on the 31st December, 1949.

The extensions to the mill are now almost complete, and the new sorting and crushing station has been in use since 5th November of this year. The arrangements at the new sorting and crushing station are proving most efficient, and should result in considerable economies in the handling and sorting of the ore. There was a substantial reduction in the cost per ton milled due to the increased tonnage, and to the increased drilling speed obtained with the introduction of tungsten carbide drill rods.

Thus, in spite of an all-round increase in the price of all-essential materials and increased payments to labour, the cost per ton milled fell from 103s. 11½d. per ton in 1949 to 93s. 9d. per ton for the 15 months. I am happy to say labour relations were cordial throughout the period, with results beneficial to both employee and employer.

The report and accounts were adopted.

THE OOREGUM GOLD MINING CO. OF INDIA, LTD.

The Annual General Meeting was held at the head office of the Company, Oorgaum, Mysore State, South India, on Friday, the 28th December, 1951.

Mr. Arthur H. E. Taylor (Vice-Chairman of the Company), who presided, in the course of his speech said:—

As you will have seen from the report, the accounting period was extended by three months beyond the normal 12 months' period to the 31st March, 1951, in order that the date of the sale of the assets should coincide with the date of the balance sheet, on the basis of which the sale was effected. The tonnage milled was 117,349, resulting in the production of 32,527 oz. of gold compared with 65,209 tons and 21,734 oz. for the year ended 31st December, 1949. The grade of ore milled has been reduced from 6.78 dwt. in 1949 to 5.54 for the period under review. 30 oz. of gold were extracted from ore from this Company milled by the Nundydroog Company. The average price received per oz. of gold during the 15 months was £22 10s. 11d., which was just under 8s. less than that received during the previous year, and resulted in total proceeds of £734,024, to which was added £814 in respect of sales of silver. After deducting royalty on sale proceeds amounting to £36,575 and adding £33,025 in respect of the claim for loss of profits due to fire during 1950, and £4,654 in respect of rents, interest, transfer fees and sundry receipts, there was a total net credit to the revenue account of £735,942.

After deducting total costs amounting to £607,383, there was a balance on revenue account of £128,559 which was transferred to profit and loss account, where £2,702 was added in respect of dividends and interest on investments and £3,897, the profit resulting from the sale of part of the Company's holding of Central Manitoba shares. To the debit of this account there was charged £5,567 staff provision fund, £1,301 United Kingdom income tax on interest and dividends received there and £76,386 in respect of depreciation and development expenditure reserve, leaving a balance of £51,904 which was transferred to the appropriation account. To this account there was also credited a net figure of £16,243, equivalent to the United Kingdom tax free dividend declared out of the profit undistributed at the 6th May, 1949, and percentage thereon.

Once again, serious setbacks have been encountered which have restricted operations in the mine and it was not until March, 1950, that production even on a limited scale could be resumed after the fire of the previous year, and the work of repairing the damaged lining and equipment of Auxiliary shaft could be restarted. In the result there was unfortunately no balance of disposable profit from which to make a distribution to the share and stockholders. The payable ore reserves have shown an increase, as compared with the figure at 31st December, 1949, and, in depth, there are signs of further improvement in developments.

Although the final stages of the arrangement for joint working with the Champion Reef Company are now in sight, delays due to the many setbacks in the past such as fires, rock bursts, power failures, labour troubles and other causes have prevented the benefits and economies of joint working being realized as soon as it was hoped.

During the period under review, a bonus amounting to 26 days' basic pay was paid to labour under the terms of an agreement arrived at between the Company and the Ooregum Labour Association in February of this year. A further demand for bonus is now being made, and in considering it the Board will give the fullest weight to the findings of the full bench of five judges of the Labour Appellate Tribunal referred to in the 1950 Labour Law Journal and to those of the Court of Arbitration set up in January, 1950, when basic principles were laid down on which to arrive at decisions on the question of bonus.

MANAGERS' REPORT

Mr. J. K. Lindsay: The period we have under review is from 1st January, 1950, to 31st March, 1951. For the first six months of this period, operations at the mine were on a restricted scale. Following the fire which broke out on 22nd October, 1949, mining operations were suspended until the beginning of March, 1950. During this time, the work of relining and reconditioning Auxiliary shaft was held up, and it was not until the end of May, 1950, that hoisting operations were resumed. This had a serious effect on output as it is one of the main underground shafts of the mine. A curtailment of electric power from the Government power station at Sivasamudram lasting from 23rd April, 1950, until 3rd June, 1950, was an additional adverse factor which affected

operations during this period. In spite of these difficulties, the tonnage milled and the development footage show a very considerable increase over the year 1949. The development footage for the year amounted to 5,325 ft., an increase of 3,126 ft. This increase was well maintained for the three months period from January to 31st March, 1951, when the development footage amounted to 1,958 ft. The mill tonnage rose from 65,209 tons in 1949 to 89,652 tons for the year 1950; for the remaining three months of the period, 27,697 tons were milled, a further considerable increase in the monthly tonnage.

Development was continued on the rich Eastern Folds which have provided a welcome additional source of high grade ore for the mill.

At 31st March, 1951, the payable ore reserves were estimated at 155,026 tons at an average grade of 9.15 dwt. per ton, an increase of 6,982 tons and 0.07 dwt. per ton in grade as compared with the total at the end of 1949. In addition, there is a tonnage of probable low grade ore estimated at 57,870 tons. This result is attributable to the better results from development during the 15 months. It may be pointed out however that above the 94th level the stoping is to a large extent carried out on the fringes of the ore shoots, thus the number of faces available for stoping is steadily decreasing, and it is below the 94th level that the major portion of the ore reserves are now located. The new sorting and crushing station has been completed and is in operation handling Champion Reef ore.

The price of all essential materials continued to increase during the period, but every effort was made to offset rising costs by improved technique, and rigid economy in the use of materials and by increased output. Thus, in spite of the greatly increased development footage, and the increased cost of materials and labour, the cost per ton milled fell from 115s. 6d. per ton in 1949 to 93s. 9d. per ton for the 15 months.

The report and accounts were adopted.

NUNDYDROOG MINES LTD.

NEW DISCOVERIES ON THE WEST LODGES JUSTIFY PREVIOUS HOPES — INCREASED ORE RESERVES

The Annual General Meeting was held at the Head Office of the Company, Oorgaum, Mysore State, South India, on Thursday, 27th December, 1951.

Mr. Arthur H. E. Taylor (Vice-Chairman of the Company) presided, and in the course of his speech said:

Dealing now with the accounts, as stated in the report, the accounting period which normally ends on 31st December was extended to 31st March, 1951, to cover a 15 month period. During the fifteen month period 218,556 tons of ore were milled resulting in the production of 56,915 oz. of gold, while 1,447 oz. were obtained from the treatment of old tailings. This satisfactory tonnage was obtained in spite of stoppages due to power cuts, and largely by reason of the excellent tonnages obtained from development. Turning now to the financial side, the average price received per oz. of gold at £22 13s. 5d. was 4s. 1d. lower than the average for the previous 12 months; the total gold sale proceeds amounted to £1,323,100, to which was added £1,937 in respect of the sale of silver. After deducting royalty £65,947 and adding £3,544 in respect of rents, interest, transfer fees and sundry receipts, there was a total net credit to revenue account of £1,262,634. Labour costs have continued to rise, mainly in consequence of an increased dearness allowance and bonus payments. The higher tonnage and better development figures are largely due to the use of improved methods and materials.

You will observe that the Company's wholly owned subsidiary, the Indian & General Mining Trust, Ltd., earned a net profit of £336 which was added to the amount of £1,832 brought forward from the previous year, and that the total of £2,168 was carried forward. From the U.K. income tax point of view there is some advantage in keeping this Company in being, and the question of expanding the activities of this investment company is receiving the consideration of the Directors.

In response to a request from certain Shareholders resident in India, for improved facilities for dealing in the Company's shares, application has been made to the Reserve Bank of India for permission to open a Dominion register in India.

In the autumn of 1950 an agreement was reached with the Nundydroog Labour Association whereby the dearness allowance was linked to the Kolar gold field cost of living index. The index has steadily risen since the agreement was entered into, and now results in a dearness allowance being paid to labour of nearly double that paid in August, 1950, the month before the new scheme was introduced. During the period under review, two bonuses were paid to labour. A further demand for bonus is now being made, and in considering it the Board will give the fullest weight to the findings of the Full Bench of five Judges of the Labour Appellate Tribunal referred to in the 1950 Labour Law Journal, and to those of the Court of Arbitration set up in January, 1950, when basic principles were laid down on which to arrive at decisions on the question of bonus.

The recent amendment to Section 17 (i) of the Indian Income Tax Act requires Indian companies and companies resident in India, such as yours, to deduct from dividends paid to non-residents supertax in all cases unless Shareholders have elected once and for all time to be assessed on world income. Share/Stockholders whose Indian income is below the supertax chargeable limit are thus affected. The procedure for obtaining an assessment on this basis is irksome and slow, and by no means clear. As a result, there has been a substantial disinvestment by non-resident Share/Stockholders. It is understood that this disinvestment has not escaped the notice of the Central Government, and that steps may be taken in the next budget to rectify the position.

MANAGERS' REPORT

Mr. J. K. Lindsay: A review of operations at the mine for the fifteen months period shows a very great increase in development footage due to the intensification and expansion of development on the Western Lodes. The development footage rose from the 7,999 ft. accomplished in 1949 to 22,913 ft. for the twelve months period ending December 31, 1950; a further 6,913 ft. was developed during the remaining three months period, making a total of 29,826 ft. for the fifteen months we have under review. Of this total, 26,680 ft. was accounted for by Western Reefs Exploration. At last year's Annual General Meeting Mr. Sydney E. Taylor described the results of west lode development as virtually the discovery of a new mine. The results since then have amply justified that view, and the developments are of outstanding significance for the future of the mine.

The tonnage milled during the year 1950 amounted to 169,498 tons, an increase over 1949 of 40,345 tons, and the oz. produced increased from 36,918 to 45,182—an increase of 8,264 oz. For the three months ended March 31, 1951, the tonnage milled was 49,058 tons, producing 13,180 oz. The tonnage milled for the year 1950 would have reached an even higher figure but for the unfortunate curtailment in the supply of electric power, which lasted from April 24 until June 3, 1950. This resulted in a total loss of 62,819 man-shifts, and during May, the mine worked for only eight days. You are no doubt aware that for a number of years, the ore reserves have been steadily declining. It is therefore most gratifying that the improved results from the greatly expanded programme of Western Reefs development are reflected in such a considerable increase to the payable reserves of the mine.

The report was adopted.

The resolution relating to the change in the Articles of Association was also approved.

Company Shorts

Dredging Contract for Orinoco Mining Co.—The Venezuelan Embassy in London has announced that a contract between the Venezuelan Government and the Orinoco Mining Co. for dredging operations along part of the Orinoco River and the Mackarao Channel has been signed in Caracas.

Cyprus Sulphur & Copper Co. (Incorporated in Cyprus) which is a subsidiary of The Esperanza Copper & Sulphur has announced that the British Metal Corporation, have been appointed as Selling Representatives for their products from the Limni Mines, Cyprus.

Cam & Motor Option.—Cam & Motor Gold Mining have announced that an option has been acquired to purchase the Pickstone Mine for £200,000, the option expires at the end of January.

The Pickstone Mine is situated near the property of Cam & Motor in Southern Rhodesia. Interest in Pickstone is held as to 50 per cent by London & Rhodesian Mining & Land, 25 per cent by Coronation Syndicate and 25 per cent by Sherwood Starr Gold Mining.

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RHODESIA-KATANGA CO.

An Extraordinary General Meeting of Rhodesia-Katanga Co. Ltd. was held on January 9 at 20 Aldermanbury, E.C.2, the Managing Director, Mr. G. C. Hutchinson, presiding in the absence overseas of the Chairman, Sir Ulric Alexander, at which it was unanimously resolved that the provisional Agreement entered into by the Company with the Anglo American Corporation of South Africa Limited and others, particulars whereof are set out in the Company's Circular to the Members dated December 19, 1951, be approved and ratified, and that the Directors be authorized to carry such Agreement into effect with such modifications thereto as they may think fit and to make such provision as they think proper for any matters not expressly dealt with by the said Agreement.

Mr. Hutchinson, in his address to the Meeting, pointed out that the Agreement recommended to the Shareholders for ratification provided that an option over the Kansanshi Mine and the surrounding farm area would be granted for a period of four years to December 31, 1955, to a new company formed to undertake further exploration of the mine. If the option were exercised, the Rhodesia-Katanga Co. Ltd. would receive £250,000 in cash and a 32 per cent interest in the new company free of cost. He recalled that before the war some 4,000,000 tons of ore had been proved at Kansanshi, averaging 3.65 per cent copper. Expert advice showed that the only economic method of treating the proved ores was by the segregation process, which had not been tried out commercially, and with the price of copper at £3.2 per ton there was no prospect of financing the project. By 1937 the price of copper had risen, and a re-estimation of the ores was made, but owing to world conditions it was not feasible to proceed, and the mine was closed. After the war, the Board concluded that the best course would be to investigate the possible existence of an economic copper sulphide deposit below the oxidized ores. Such sulphide ores would be amenable to flotation, and might justify the installation of a segregation plant or other process to treat the oxidized ores in conjunction therewith. Negotiations to

this end were conducted, without result, with two American mining houses and were followed by an application to the E.C.A. authorities which had been receiving favourable consideration. The arrangement now made with the Anglo American Corporation of South Africa Ltd., and its associates, however, appeared to be very strongly in the Company's interests, and ensured that the mine would receive the highest technical direction and financial assistance.

Mr. Hutchinson concluded on the warning note that it must not be assumed that the new exploration would necessarily reach a successful conclusion, which would depend entirely on the results of the investigation.

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THE CENTRAL MINING - RAND MINES GROUP**DIVIDENDS ON SHARES TO BEARER.**

The following dividends will be paid on or after 7th February, 1952, after surrender of the appropriate coupons at the London Office of the Companies, 4, London Wall Buildings, E.C.2, or, with the exception of the Company marked with an asterisk, at the Credit Lyonnais, Paris.

The dividends will be payable in British currency, at par, at the rates declared in South African currency (Column No. 4), less South African non-resident shareholders' tax (Column No. 5).

COUPONS presented for payment at the London Wall Office will, unless accompanied by Inland Revenue declarations, be paid at the rates shown in Column No. 12, which are arrived at after deduction of United Kingdom income tax (Column No. 11), at rates reduced to allow of relief in respect of Dominion taxes.

COUPONS presented at the Credit Lyonnais, Paris, will be subject to the deduction of French Income tax from the amounts of the dividends shown in Column No. 6.

NAME OF COMPANY (Each incorporated in the Union of South Africa.)	Dividend No.	Cou- pon No.	Amount of dividend declared per share.	Deduction in respect of South African non-resident shareholders' per share.	Amount of dividend after such deduction, per share.	Provisional allowance of credit authorised in the £. per share.	Gross amount of dividend, per share.	Rate of taxation applicable in the £. per share.	Rate of deduction of United Kingdom income tax in the £. per share.	Amount of United Kingdom income tax deducted, per share.	Net amount of dividend per share. (12)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
City Deep, Ltd.	64	64	2 6	2.25	2 3.75	4 9	3 0.39	—	4 9	8.64	1 7.11
Consolidated M. Reef M. & E., Ltd.	84	81	3 6	3.15	3 2.85	4 9	4 2.95	8 3	4 9	1 0.10	2 2.75
Crown Mines, Ltd.	101	101	4 6	4.05	4 1.95	4 9	5 5.51	8 11	4 9	1 3.56	2 10.39
Durban Deepdale Deep, Ltd.	62	62	2 6	2.25	2 3.75	4 9	3 0.39	7 11	4 9	8.64	1 7.11
East Rand Deep, Ltd.	65	65	2 6	2.25	2 3.75	4 9	3 0.39	—	4 9	8.64	1 7.11
Geldenhuys Deep, Ltd.	80	80	6	1.5	1.5	1 8	6.05	—	7 10	2.37	3.18
Modderfontein East, Ltd.	49	30	2 6	2.25	2 3.75	4 9	3 0.39	—	4 9	8.64	1 7.11
Rand Mines, Ltd.	97	97	3 6	3.1185	3 2.8815	4 9	4 2.9921	—	4 9	1 0.1106	2 2.7709
Rose Deep, Ltd.	93	93	2 6	2.25	2 3.75	4 9	3 0.39	16 11	4 9	8.64	1 7.11
Transvaal Con. Land & Ex. Co., Ltd.	29	29	1 9	1.575	1 7.425	4 9	2 1.475	5 6	4 9	6.05	1 3.375
*Transvaal Gold M. Est., Ltd.	82	82	3	0.225	2 7.75	2 10	3.233	—	6 8	1.078	1.697

*These rates also apply to the dividends paid by the three Companies concerned on 9th August, 1951.

Coupons required to be paid at the London Office must be left at least four clear days for examination and may be presented any day (Saturdays excepted) between the hours of 11 and 2. Depositors will be notified at the time of deposit when the cheques will be ready.

Listing forms may be had on application.

Where no figure is shown in Column No. 9, the rates of South African taxation applicable in the £ cannot yet be ascertained, as they are dependent on the final particulars of the South African taxation of the companies concerned, which are not yet available.

Note: The Companies have been asked by the Commissioners of Inland Revenue to state:—

Under the provisions of Section 36 and the Sixth Schedule of the Finance Act, 1950, relating to "unilateral relief" from double taxation, South African tax applicable to the dividends is allowable as a credit against the United Kingdom tax payable in respect of the dividends. The deduction of tax at the reduced rates in the £ (Column No. 10) instead of at the Standard Rate of 9s. 6d. in the £ represents a provisional allowance of credit at the rates shown in Column No. 7. The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be more or less than the rate shown in Column No. 7 but must not exceed three-quarters of the personal rate. Revision of the credit involves corresponding adjustments of the gross amounts of the dividends for United Kingdom tax purposes (Column No. 8).

THE GROSS AMOUNT OF THE DIVIDEND PER SHARE TO BE INCLUDED IN ANY STATEMENT OF TOTAL INCOME FOR UNITED KINGDOM INCOME TAX PURPOSES IS SHOWN IN COLUMN NO. 8.

4, London Wall Buildings, London, E.C.2.
9th January, 1952.

A. MOIR & CO.,
London Secretaries of the above-named Companies.

Mining Men

The death has been announced of Mr. S. T. Amner a manager in London of Union Corporation.

Mr. Percy J. Baird has resigned from the board of the British South Africa Co.

Mr. J. C. Bennett has been appointed joint managing director of Henry Gardner & Co.

Mr. A. Chester Beatty Jnr. has been appointed vice-chairman of Roan Antelope Copper Mines, of Rhodesian Selection Trust and Mufulira Copper Mines.

Mr. Louis Lionel Collin has resigned his position as consulting metallurgist to the Portuguese Government, which he held for ten years, to set up in private practice in Bulawayo, South Rhodesia. Mr. Collin's new address will be 205, Glynnis Building, 63, Rhodes Street, Bulawayo, Southern Rhodesia.

Mr. J. H. A. Diering has retired from the position of manager of Transval Gold Mining Estates.

Mr. Henry H. Fowler has been nominated as administrator of the National Production Authority in place of **Mr. Manley Fleischmann** who has relinquished his position as administrator of N.P.A. while remaining head of the Defence Production Administration.

Mr. Norman Hill, Australian representative of Sir James Hill & Sons, has been appointed a director of the Central Board of the Commercial Bank of Australia, Melbourne in succession to **Mr. W. J. Byrne**, deceased.

Mr. G. Harvey has joined the staff of Frontino Gold Mines.

Brig. Ralph Micklem has been appointed a director of Mufulira Copper Mines and Rhodesian Selection Trust.

Mr. S. G. Menell has resigned from the boards of Loraine Gold Mines and Jeanette Gold Mines. **Mr. I. Shaffer** has been appointed a director of both companies.

Mr. Harry A. McDonald, chairman of the Securities and Exchange Commission, has been nominated by **President Truman** as administrator of the Reconstruction Finance Corporation in succession to **Mr. Stuart Symington** who has resigned.

Mr. R. Pawle has resigned from the boards of Temoh Tin Dredging, Sungei Kinta Tin Dredging and Ipoh Tin Dredging.

Mr. D. B. Reid has been appointed as director of Scottish Australian Mining to fill the vacancy created by **Col. Ian Forbes** who has left the board.

Mr. P. R. Scutt, formerly director of production of Tecalemit Ltd., has been appointed director and general manager.

Mr. H. O. Smith has resigned from the board of Imperial Chemical Industries.

Mr. Heath Steele has resigned from the boards of Roan Antelope and of Rhodesian Selection Trust and **Mr. Walter Hochschild** has been appointed a director of Roan Antelope, of Rhodesian Selection Trust and Mufulira Copper Mines.

The Institution of Mining Engineers will hold their annual general meeting at the Connaught Rooms, Great Queen Street, London, W.C.2, on Thursday, January 17, at 11.15 a.m.

The Institution of Mining and Metallurgy has announced that at the general meeting to be held on February 21, a paper entitled "The Dust Problem in the Kolar Gold Mines" by **Mr. H. H. Watson**, of the Pneumoconiosis Research Unit (South Wales) of the Medical Research Council will be submitted for discussion.

ANGLO AMERICAN CORPORATION OF SOUTH AFRICA LIMITED GROUP

DIVIDENDS ON STOCK AND SHARES TO BEARER

With reference to the notice of declaration of dividends published in the Press on 21st December, 1951, the following information is published for the guidance of holders of stock and share warrants to bearer.

The undermentioned dividends will be paid in British currency at par on or after 7th February, 1952, against surrender of the appropriate coupons at Barclays Bank (Dominion, Colonial & Overseas), Circus Place, London Wall, London, E.C.2, or at the equivalent in French currency at Banque de l'Union Parisienne, 6 and 8, Boulevard Haussmann, Paris, 9e. Listing Forms may be obtained on application at the offices of either of these paying agents.

Coupons presented for payment at Barclays Bank (Dominion, Colonial & Overseas) will, unless accompanied by Inland Revenue declarations, be paid at the amounts shown in Column No. 12, which are arrived at after deduction of United Kingdom Income Tax (Column 11) at rates reduced to allow for relief in respect of Dominion Taxes. Coupons must be left four clear days for examination and may be presented any day (Saturday excepted) between the hours of 11 a.m. and 2 p.m.

NAME OF COMPANY (Each incorporated in the Union of South Africa)	Class of Capital	Divi- dend No.	Cou- pon No.	Amount of dividend declared per £1 Stock or per Share	South African non-resident Shareholders' tax deducted per £1 Stock or per Share	Amount of dividend after deduc- tion of S.A. non-resident Shareholders' tax per £1 Stock or Share	Rate of relief authorised in the £ Stock or Share	GROSS Amount of dividend for United Kingdom tax purposes	Rate of deduction of United Kingdom Income Tax in the £	Amount of United Kingdom Tax deducted per £1 Stock or Share	NET Amount of dividend per £1 Stock or Share
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Anglo American Corporation of South Africa, Limited.....	6% Cum. Pfd. Stock	45	45	0 7.2 0.4968	0 6.7032 1.0125	1 4.56 1 0.4875	0 7.2 4 9	8 1.44 3 4.377	8 1.44 4 9	2.9232 3.8895	0 3.78 0 8.598
Brakpan Mines, Limited.....	Shares	78	78	1 3.0	1 2.7	1 2.93	4 9	3 7.67	4 9	10.37	1 10.93
Daggafontein Mines, Limited.....	Shares	38	38	2 3	2.025	2 0.975	4 9	2 8.754	4 9	7.779	1 5.196
The South African Land and Exploration Company, Limited.....	Shares	27	27	2 3							
Spring Mines, Limited.....	Shares	60	60	0 4.5	0.0375	0 4.1625	1 6	0 4.5	8 0	1.8	0 2.3625

For and on behalf of ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LIMITED.

11, Old Jewry, London, E.C.2. 9th January, 1952.

W. E. GROVES, London Secretary.

The following notes are added at the request of The Commissioners of Inland Revenue:

- (i) As regards the dividends payable by Brakpan Mines Limited, Daggafontein Mines Limited and The South African Land and Exploration Company, Limited, under the provisions of Section 36 and the Sixth Schedule of the Finance Act 1950 relating to "unilateral relief" from double taxation, South African tax applicable to the dividend is allowable as a credit against the United Kingdom tax payable in respect of the dividend. The deduction of tax at the reduced rate of 4s. 9d. in the £ instead of at the standard rate of 9s. 6d. in the £ represents a *provisional* allowance of credit at the rate of 4s. 9d. in the £. The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be more or less than 4s. 9d. in the £ but must not exceed three-quarters of the personal rate. Revision of the credit involves a corresponding adjustment of the amount shown above as the GROSS amount of the dividend for United Kingdom tax purposes.
- (ii) As regards the dividends payable by Anglo American Corporation of South Africa Limited and Spring Mines Limited under the provisions of Section 36 and the Sixth Schedule of the Finance Act 1950 relating to "unilateral relief" from double taxation, South African tax applicable to the dividend is allowable as a credit against the United Kingdom tax payable in respect of the dividend. The deduction of tax at the reduced rate instead of at the standard rate represents a *provisional* allowance of credit in respect of South African Non-Resident Shareholders' Tax. The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be less than the rates shown in the above table as it must not exceed three-quarters of the personal rate. Revision of the credit involves a corresponding adjustment of the amount shown above as the GROSS amount of the dividend for United Kingdom tax purposes.

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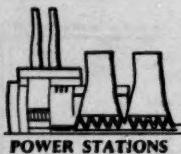
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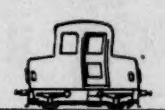


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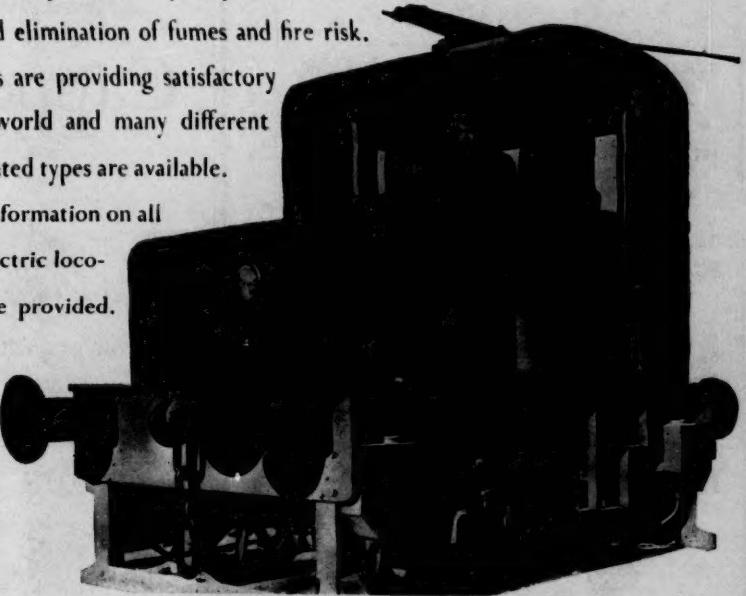
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